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ABSTRACT

This report presents results of the assessment of economic impacts of a year-round school (YRS) program as it operated in one junior high school and its four feeder elementary schools. Chapter 2 presents the theoretical background of the cost model and Chapter 3 details the model itself. Chapter 4 is the application of the model to the particular district. Chapter 5 contains a discussion of the sensitivity of the results to various policy changes. Chapter 6 addresses some additional general issues related to the cost of the YRS program. Chapter 7 summarizes the study findings and conclusions. Six appendices containing data about the study are included along with a glossary and a bibliography. There are three primary study findings. The first is that the most appropriate method for YRS cost analysis is to compare the actual costs incurred under YRS with a simulation of costs for providing the same educational program to the same student population during the same time period under a traditional schedule. Second, properly implemented, a YRS program saves money. Third, policy changes can substantially affect YRS savings. (Author/IRT)

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SRI International

A STUDY OF YEAR-ROUND SCHOOLS

Volume II: Cost Analysis

November 1978

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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PREFACE

The Office of the Assistant Secretary for Planning and Evaluation (ASPE) of the Department of Health, Education, and Welfare has been studying year-round school (YRS) programs since 1974. The first ASPE-sponsored report on YRS was issued in May 1975 (Rice et al.). This report described the many models for YRS programs and discussed their major objectives and effects. Later that year a second report (Shepard et al., 1975) documented the history of the YRS movement in the United States and proposed a research design for a larger, more comprehensive study of a YRS program.

In 1976, ASPE issued a Request for Proposals (RFP-71-76-OS), entitled "A Detailed Case Study of a Year-Round School Program Focusing on Migrant and Other Disadvantaged Children." Reflecting the influence of the research design proposed in the Shepard report, the RFP called for an assessment of the educational, social, and economic impacts of the YRS program in the Pajaro Valley Unified School District (PVUSD). The contract for the study was awarded to SRI International (then Stanford Research Institute) on June 30, 1976. This report presents the results of SRI's assessment of economic impacts, including:

- A model to be used in evaluating the current economic impact of a YRS program operating in either a school or a school district.
- A cost analysis of several YRS programs at both the school and district levels.
- A model to be used for estimating the future economic impact of conversion to a YRS program at either the school or school district level.

ACKNOWLEDGMENTS

Working with the YRS project staff has been a stimulating and enriching experience. Throughout the project, we have benefited greatly from the thoughtful counsel of our Project Officer, Dr. Keith Baker. He has been an integral part of our project "team" and we thank him for his continued support.

The Pajaro Valley Unified School District staff went out of their way to help us with this study. So many different people helped us that it is impossible to individually thank them all. Jim Baker, Director of Instructional Services, was especially helpful, and we came to view him as a member of our project team. Dr. Wallace Raynor, Superintendent, ensured that we would be provided with whatever information was necessary. Among the many others at PVUSD, we would like to thank:

Keith Bryant	Don Knauf
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Cameron Goode	Larry Porter
Richard Guertin	Walter Resh
Francisco Jimenez	Donald Sauer

and members of the Board of Trustees.

Many SRI staff members participated in this study. We are grateful to our Project Supervisor, Richard Marciano, for his advice and encouragement. Teresa Middleton was responsible for field operations; the high quality of the data collected is largely due to her efforts. Among the others who contributed to this study are:

Dale Ashworth	Myra Hodgson
Les Alderson	Steve Kutner
Mary Ann Awai	Bonnie Miller
Arlo Brenno	Christine Miller
Sue Bryson	Lynn Newman
Marion Collins	Susan Peterson
Chris Cooper	Susan Russell
Jay Cross	Mimi Stearns
Jane David	Tom Thomas
Larry Durgin	Judy Turner
Ann Hershberger	Ana Maria Valenzuela
Jim Hewlett	Anne Wright

Several consultants reviewed the test and survey data: Dr. Michael Kirst, Dr. David Pascoe, and Dr. Leo Lopez. The cost analysis was reviewed by Dr. Steven Klees, Dr. Henry Levin, and Dr. Manny Smith. Some cost data were collected jointly with the Office of the Auditor General of the State of California; the auditors were Sam Cochran, Tom Hayes, Pat Nishi, and Gene Potter. Klaus Krause edited the final report and provided many helpful suggestions on presentation of material. Judy Davis coordinated the final typing and printing and kept track of loose ends. As in any project of this magnitude there are many others who contributed moral support.

1 INTRODUCTION

Background

For the past 50 years, the standard school year in the United States has been 9 months long, generally beginning around Labor Day and continuing until early June. During these 9 months, most schools are required by state law to be open approximately 180 days. During the three summer months most schools are closed, although some operate optional summer school programs. Schools implementing year-round educational programs are open 12 months a year. Children in year-round schools (YRS) usually are not required to attend school more than 180 days. However, these days of attendance occur during a 12-month period rather than during the 9-month, September-to-June traditional school year. Attendance periods are staggered for different groups of students so that from two-thirds to four-fifths of the school's students attend regular classes at any given time, while the remaining students are on vacation.

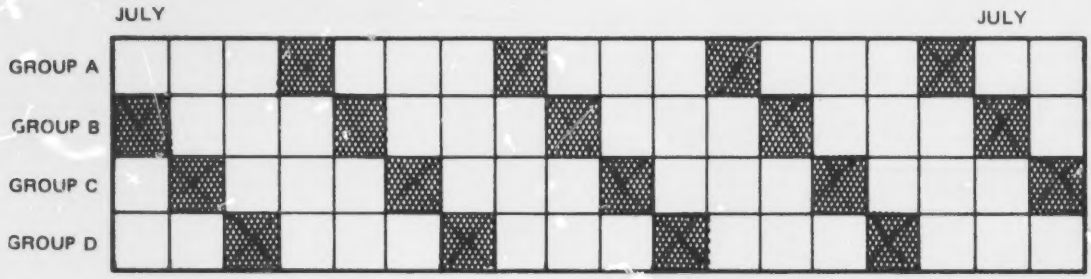
During the past 10 years, hundreds of schools have implemented year-round educational programs. The most common reason for such a change is a rapid increase in a school or a district's enrollment. Simply by changing its calendar, a school may increase its capacity by as much as 50%. Other reasons for a change to a year-round calendar include the ability to provide attendance options for parents, to provide more remedial opportunities, to reduce time spent in relearning forgotten material, and to serve as a catalyst for changing the curriculum.

This report is part of a case study of the year-round school program operating in the Pajaro Valley Unified School District (PVUSD) in California (see Figure 1-1). In 1972, to alleviate overcrowded classrooms and eliminate double sessions, PVUSD implemented a 45-15, year-round school calendar in five schools. A 45-15 calendar is one of many possible year-round attendance plans. Students in a 45-15 YRS are placed into one of four groups of approximately equal size (Group A, B, C, or D). Each group attends school for 45 consecutive weekdays (9 weeks) and then

Basic map copyright National Automobile Club; used by permission.

FIGURE 1-1 LOCATION OF PAJARO VALLEY UNIFIED SCHOOL DISTRICT

is on vacation for 15 weekdays (3 weeks). Hence, one-fourth of the students are always on vacation, thereby increasing each school's capacity by 33%. Such a "45-15" schedule is graphically represented in Figure 1-2.



Each block represents 15 week days; students in a group attend school 45 days and then are off 15 days.

FIGURE 1-2 YEAR-ROUND 45-15 SCHEDULE (Staggered)

SRI International's case study of PVUSD's year-round schools program was conducted for the Office of the Assistant Secretary for Planning and Evaluation, DHEW. The study had three basic objectives:

- To assess the educational impacts of the year-round school program, particularly on educationally disadvantaged and migrant students. Patterns of achievement of migrant, disadvantaged, and regular students attending YRS are compared with those of students attending schools under traditional calendars.
- To assess the social impacts of the year-round school program on parents, teachers, and the community at large. Attitudes of parents whose children attend YRSs are compared with attitudes of parents whose children attend traditional-calendar schools. In particular, parents' attitudes about the quality of education, about their children's schools and teachers, and about year-round education are compared. YRS and non-YRS teachers' attitudes, especially toward year-round school programs, are compared. Members of the community at large were surveyed to determine what impacts the change in school calendars has had on recreational facilities, businesses, youth centers, and delinquency.
- To assess the economic impact of the year-round school program on the cost of education in PVUSD. Construction costs avoided through year-round use of existing facilities are estimated, and actual operating costs are compared to a projection of costs

that would have been incurred under the traditional calendar. The impact of the year-round program on the district's annual budget is estimated, and areas in which the year-round schedule resulted in a significant saving (or a significant added expense) are identified.

This report presents results of the assessment of economic impacts of the PVUSD year-round schools program. It has been assumed that the cost model developed by SRI for this study will be of interest to local school officials faced with the decision of whether to institute a YRS program, or to continue one already in existence. Accordingly, a handbook designed to help school administrators make use of the SRI cost model has been prepared as a companion volume to this report.

Results of the assessment of educational and social impacts of the YRS program are presented in a separate volume (Volume I, Final Report).

The Pajaro Valley Unified School District

The present study has focused on the experiences of one California school district--the PVUSD. The PVUSD came into existence in 1965 when several smaller school districts were consolidated. Covering portions of three California counties (Santa Cruz, Monterey, and San Benito), the district encompasses approximately 150 square miles and has 16 elementary schools, 3 junior high schools, 2 four-year high schools, a continuation high school, and an adult evening school. The only city within the PVUSD boundaries is Watsonville, incorporated in 1868. Total district enrollment is slightly more than 13,000 students, of whom 64% are Caucasian, 30% are Mexican-American, 5% are Oriental, and 1% are Black.*

The primary financial base of the PVUSD is provided by agriculture, which is generally labor-intensive (truck farming, commercial flower growing), and by recreation (the resort area on Monterey Bay). The district also includes a number of military dependents, living off-base, of Army personnel stationed at Fort Ord. In 1975-76 the total taxable

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*All data are drawn from 1975-76, the most recent school year for which complete fiscal information is available.

assessed valuation in the district was $22 million, of which 87% was located in Santa Cruz County, 12% in Monterey County, and just over 1% in San Benito County. In 1975-76, the district's property tax rate was $4.84 per hundred dollars of assessed valuation (an average figure for a California unified district). The total district budget (including federal and state aid) amounted to nearly $18 million; a breakdown of income by federal, state, county, and local sources is provided in Table 1-1. Annual per-pupil costs in PVUSD amounted to $1,381, which is somewhat less than the state and national averages of $1,574 and $1,462, respectively (Market Data Retrieval, 1977).*

Between 1966 and the beginning of the 1971-72 school year, voters in the PVUSD failed to pass 10 consecutive bond issues and tax overrides (see Table 1-2). As a result, there were 950 students on double sessions and 429 others in overcrowded† classrooms in the 1971-72 school year. In addition, the district faced the imminent loss of a major portion of one school that had been judged potentially unsafe in an earthquake.

In the spring of 1972, the PVUSD proposed implementation of a year-round program in five schools--Amesti, Calabasas, Freedom, and Hyde Elementary Schools and Rolling Hills Junior High School--on the grounds that a YRS program offered the only hope of meeting the critical need for classroom space in the face of continuing hostility to bond issues and tax overrides. The PVUSD Governing Board (which consists of seven members elected to 4-year terms from five trustee areas) agreed to the adoption of YRS in the five schools for a trial period of 1 year, beginning in July 1972. This trial period was subsequently extended for a second year. In 1974 the Board voted to continue the year-round program as long as the shortage of facilities remained a problem. For the past 4 years, the same five schools have continued on a year-round schedule.

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*References are included in the bibliography following the appendixes.

†See the Glossary for definition of terms such as "overcrowded."

Table 1-1

PVUSD 1975-76 INCOME--ADOPTED BUDGET

			Percent of Total Income
Federal Income			
ESEA Title I	$ 365,976		
ESEA Title II	8,178		
ESEA Title VII	168,823		
ESEA Migrant Summer School	92,066		
Adult Basic Education	24,811		
Vocational Education	48,670		
CETA Program	768,402		
Delayed Development Title II	42,517		
		$ 1,519,443	8.69
State Income			
Basic & Equalization Aid	$3,537,812		
Special Education Allowance	381,111		
Transportation Allowance	496,000		
Early Childhood Education	185,959		
Educationally Disadvantaged Youth	294,045		
Miller-Unruh	29,454		
Teacher Retirement Allowance	123,891		
Driver Training Allowance	57,000		
Instructional T.V.	150		
Miscellaneous Funds	46,500		
		$ 5,152,124	29.45
County Income			
Consultant Allowance	$ 3,000		
Miscellaneous Funds	41,500		
		$ 44,500	0.25
Local Income			
Secured Roll Taxes--General	$9,231,892		
Unsecured Roll Taxes--General	600,000		
Prior Year Taxes--General	150,000		
Secured Roll Taxes--Restricted	598,739		
Unsecured Roll Taxes--Restricted	56,861		
Prior Year Taxes--Restricted	16,750		
Sale of Equipment and Supplies	1,000		
Interest	70,000		
Fees	12,000		
Other Income	40,000		
		$10,777,242	61.61
Net Beginning Balance		$ 144,175	
		$17,637,484	100.00

Source: Pajaro Valley Unified School District
Adopted Budget 1975-76

Table 1-2

THE PRE-1972 BOND ISSUE/TAX OVERRIDE HISTORY OF PVUSD

Date	Type	Amount	Percent Turnout	Percent Vote	Result*
6-7-66	Bond	$3,000,000	61%	37% voted yes	Failed
	Tax	Raise $2.86 to $3.60	61%	31% voted yes	Failed
3-14-67	Bond	$3,466,000	52%	44% voted yes	Failed
	Tax	$2.86 to $3.59	52%	41% voted yes	Failed
6-4-68	Bond	$6,260,735	79%	57% voted yes	Failed
11-5-68	Bond	$6,200,735	73%	54% voted yes	Failed
6-2-70	Bond	$3,282,000 (elementary)	62.8%	54.3% voted yes (elementary)	Failed
		$3,265,000 (high school)	62.8%	49.5% voted yes (high school)	Failed
	Tax	$2.86 to $3.17	62.8%	46.7% voted yes	Failed
6-1-71	Tax	$2.86 to $3.57	42.8%	47.8% voted yes	Failed

*66-2/3% approval needed to pass.

Source: Watsonville Register-Pajaronian

PVUSD participated in the 1975 study by Abt Associates that surveyed the YRS movement (Shepard et al.). Because of this involvement, PVUSD came to the attention of ASPE, which noted the large number of migrant and disadvantaged students in the district. Thus, ASPE and PVUSD agreed to have the district become the focus of the current study.

SRI began collecting economic data within PVUSD in October 1976. With the concurrence of DHEW, and in conjunction with the California Legislature's Office of the Auditor General, SRI began collecting data in other California districts with YRS programs in April 1977. In general, we have attempted to answer the set of questions detailed in the RFP:

- How do the operating costs of a year-round school compare with those of the same school operating on a traditional 9-month schedule? The meager YRS cost literature suggests great

variation between operating costs of a YRS and those of a traditional-calendar school (TCS).

- If YRS teachers are given the option to extend their contracts, how does this affect operating costs? A year-round schedule provides teachers with the opportunity to work more than the usual 180 days in a standard school year. This opportunity may result in either an increase or a decrease in the average cost to the district for a teacher-day, depending on which teachers choose to extend their contracts.
- If nonteacher YRS personnel are given the option of extending their work contracts, how does this affect operating costs?
- If personnel work longer contract periods, how does this affect employee benefits? Some employee benefits have ceilings; e.g., regular retirement benefits are earned up to a maximum of so many days per year.
- What is the response of staffing ratios to the implementation of YRS? In effect, the year-round schedule makes "more" classrooms available at a school; a change in staffing ratio would change this classroom "surplus."
- How do transportation costs respond to YRS? Theoretically, a 45-15 schedule should reduce the Local Education Agency's (LEA's) need for buses and otherwise affect transportation costs.
- How are depreciation schedules affected by YRS? If a school is in use for more days during the year, is its depreciation schedule accelerated?
- What is the effect of YRS on the allocation of overhead costs?
- What site-specific cost factors are critical to the determination of operating costs?
- Where YRS has been implemented primarily for reasons of cost, how do the anticipated savings compare with the actual savings?

Chapter 2 presents the theoretical background of the cost model,* and Chapter 3 details the model itself. Chapter 4 is the application of the model to the particular case of PVUSD. Chapter 5 contains a discussion of the sensitivity of the PVUSD results to various policy changes. Chapter 6 addresses some additional general issues related to the costs of YRS. Chapter 7 summarizes the study findings and conclusions.

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*As used in this study, "cost model" means a procedure used to develop a representation of reality useful to policymakers looking primarily at economic decisions.

2 THEORETICAL FRAMEWORK

Early in the study we reviewed the existing cost and educational economics literature and the very few existing YRS cost studies. Because of problems with the methodologies used in these cost studies, and because of the inapplicability of the more general literature, we concluded that a unique economic model was needed for this evaluation. This chapter discusses the problems we found, our responses to them, and the assumptions underlying the model we developed. The model itself is presented in Chapter 3.

There are three primary problem areas:

(1) Focus: What policy alternatives are being compared? The focus of much of the available cost literature is on comparison between alternative educational programs rather than on the delivery of the same educational program under different calendars.

(2) Time Frame: During what period(s) are YRS and TCS costs compared? YRS studies typically compare costs incurred before and after the introduction of the YRS program, rather than comparing the current situation with a simulation of the expenditures under a traditional calendar.

(3) Measurement: What costs should be compared? The studies we examined differ widely with respect to the types of costs included.

In subsequent sections of this chapter we will examine each of these areas in turn. We will describe some of the major problems that result from frequently used approaches and discuss how our model overcomes the limitations of these approaches. In the concluding section of this chapter, we will summarize the assumptions underlying the model.

Focus: What Policy Alternatives Are Being Compared?

Educational cost studies are usually one of two types:

- Cost-benefit studies in which budgetary costs are related to <u>social</u> outcomes.

- Cost-effectiveness studies in which budgetary costs or resource allocations are related to particular educational outcomes.

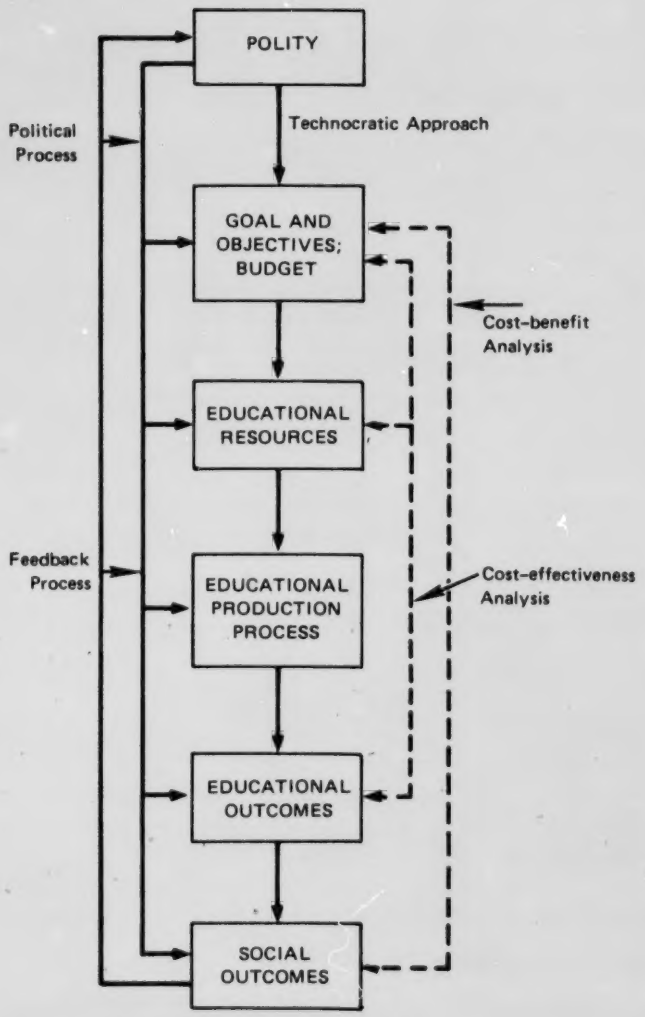
This cost analysis is neither a cost-benefit nor a cost-effectiveness study. We hold the educational program constant and compare the expenditures under the two calendars.

To clarify this distinction, it is useful to refer to a theoretical overview of the educational system (Figure 2-1) suggested by Henry Levin (Levin and Carnoy, 1976). According to this framework, society directly and indirectly influences the goals and objectives of a school district and the various budgetary expenditures. These goals and objectives determine how educational resources (teachers, materials, etc.) are allocated; the pattern of allocations in turn defines the educational production process (e.g., team teaching of reading). From this process are derived various educational outcomes (e.g., improved reading scores) and social outcomes (e.g., increased literacy, a larger supply of librarians, etc.).

In cost-benefit analysis, costs are computed for each policy alternative and then compared to the benefits of the alternatives, these benefits being expressed in dollars. (Examples of cost-benefit analysis include Levin, 1975; Ribich, 1968; and Spiegelman et al., 1968.) In cost-effectiveness analysis, the policy alternative costs are computed and then compared with the effectiveness of each alternative in achieving a particular policy objective, these objectives being expressed in non-monetary terms, such as reading skill improvement (see, for example, Levin, 1970 and 1975).

Policy alternatives usually produce alternative educational processes (each with a unique cost), which in turn result in differing outcomes. For example, the Follow Through Planned Variation experiment involved policy alternatives for education of children from low-income families; the resultant educational processes varied greatly in their outcomes--and their costs (Rogers et al., 1977).

The policy alternative of a year-round schedule, on the other hand, has usually not been regarded as an alternative educational process.



SOURCE: Henry M. Levin

FIGURE 2-1 A CONCEPTUAL FRAMEWORK OF THE EDUCATIONAL SECTOR

More often it is advocated as a less expensive way of providing the same educational services offered under a traditional schedule (an attractive alternative for a school district faced with expanding enrollment and limited school construction funds). Thus the YRS policy alternative holds the education process constant. The contrast is between two different patterns or schedules for allocation of resources.

The purpose of the YRS cost analysis (and the YRS economic model) is to compare the costs of a program of instruction implemented under a traditional calendar with the identical program implemented under a year-round calendar. Since we are comparing alternatives for the delivery of identical services, differences in outcome are not an issue.* Therefore, this study should not be confused with the cost-benefit or cost-effectiveness methodology used in other program evaluations.

There is a second issue involving focus: The unit of analysis is different in this study than it is in most cost-benefit or cost-effectiveness studies. Studies of alternative educational processes (e.g., the SRI Follow Through evaluation) generally treat the classroom (or the child) as the unit of analysis. In the case of YRS, the primary locus of change is the school. In PVUSD, a year-round schedule was implemented in only 5 of the district's 22 schools. In such situations we would expect that cost impacts observable at the school level would be much less apparent at the district level. Even in cases in which an entire district shifts to a YRS calendar, cost impacts may vary across schools. Finally, although school-level data can be aggregated to the district level, disaggregation from the district to the school is more difficult and less satisfactory, because of school-to-school differences in the nature of services provided, teacher contract extensions, and other critical factors. For these reasons, we conclude that the school is the most appropriate unit of analysis.

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*Other phases of our study (see Volume I, Final Report) investigate differences in educational outcomes.

Time Frame: During What Period(s) Are YRS and TCS Costs Compared?

There are several ways in which the impact of a schedule change can be analyzed. Among the most commonly found are the following:

(1) The current situation at a year-round school can be compared with the prior situation at the same school (i.e., when it operated under a traditional calendar).

(2) The current situation at a year-round school can be compared with the current situation at another school operating under a traditional calendar.

(3) The current situation at a year-round school can be compared with a simulation of the way it would be under a traditional calendar.

Most YRS studies are of the first type. The most widely known of these is the cost analysis done at the Valley View School District in Romeoville, Illinois. There are two problems in the Valley View analysis that are fairly typical of YRS cost studies of this type:

(1) The comparison is confounded by other policy changes introduced concurrently with the YRS schedule (e.g., teachers received a new contract, bus transportation began to be provided directly by the district instead of by a vendor).

(2) The comparison is based on different enrollment levels [e.g., the number of students transported increased from 5,166 in 1969 under a traditional schedule to 6,950 in 1971 under a year-round schedule "without the purchase of additional buses, or the employment of additional drivers or supervisors" (Hermansen and Gove, 1971, p. 118)]. There are some costs that do not respond smoothly to an enrollment increase. For example, although teacher costs increase linearly as enrollment goes up, administrative costs often change as a step function; that is, they remain constant until enrollment reaches a certain point and then abruptly increase (e.g., from an enrollment of 1 to 600 students a school has 1 principal; from 601 to 900 students a school has 1 principal and a half-time vice-principal; above an enrollment of 900 a school has 1 principal and a full-time vice-principal). We refer to this phenomenon as "nonlinear incremental cost changes."

In the Valley View study, costs are not adjusted to reflect the various policy changes (e.g., teacher costs under YRS are not adjusted to reflect the contract in effect before the change to a year-round schedule). Similarly, no adjustment is made for nonlinear incremental cost changes due to enrollment increase (e.g., transportation costs are not adjusted

to utilize the per-student mile charge in effect before the schedule change).

Few published studies compare the current situation at a YRS to the situation at another school operating under a traditional schedule (the second type mentioned above). In his doctoral dissertation, Robert Jewell Lloyd concludes:

> It is virtually impossible to establish a control situation whereby a traditional school and a year-round school are perfectly matched for comparative purposes. The age of facilities, type of construction, size and design of play area, tenure and salary of employees, type of community served, etc., are all factors that cause operating costs to vary, regardless of the type of program being compared. (Lloyd, 1973, pp. 115-116)

Expanding on Lloyd's comment, we note three potential problems in such comparisons:

(1) The comparison may be confounded by policy differences between the two schools (e.g., one school may have a different staffing ratio than the other school).

(2) The comparison may be based on different enrollment levels and affected by nonlinear incremental costs (e.g., one school may have an enrollment of 300 and one secretary while the other may have an enrollment of 400 and two secretaries).

(3) The schools may have different costs for the same resources (e.g., one school's principal may earn $20,000 per year while the other earns $25,000 per year).

All these difficulties can be overcome by various types of adjustments. For example, the policies and resource costs at one school can be simulated at the other school. However, equalizing the resource costs at two different schools requires adjustment of the circumstances at one or both for comparability. But such adjustments necessarily imply changes in the educational programs (e.g., adjusting a staffing ratio from 20:1 to 30:1 implies a change in educational services to the students).

Therefore, we believe that the simplest procedure is to compare the current situation at a YRS with a simulation of what the same school would cost to operate under a traditional calendar (the third type of analysis mentioned above). The strategy of comparing the current situation at a school (under a year-round or a traditional calendar) with a

simulation of the situation under the other calendar ensures that the educational production process at the school is held constant. This must be done to obtain a reasonable evaluation of the cost impact of a schedule change. Such a comparison also facilitates the discussion of the situation at a school in terms that the decision makers can relate to easily.

Measurement: What Costs Should Be Compared?

Typically, YRS cost studies emphasize the potential saving to the LEA realized by avoiding school construction costs. For example, the Northville, Michigan (Northville Public Schools) study cites a figure of $65 million in potential savings associated with a shift to YRS.

Actually, there are three types of costs relevant to cost studies of YRS:

- Capital Costs--the outlay necessary to provide school buildings and equipment. Since this expenditure results in the acquisition of fixed assets that have benefits for more than 1 year, the actual indebtedness is extended over a period of years (and usually paid from the district debt fund).
- Operating Costs--the outlay required to keep the educational program running. These routine expenditures result from the execution of the annual budget (paid from the general fund).
- Implementation or Transition Costs--the outlay involved in the conversion to a year-round schedule. These are one-time expenditures (usually paid from the general fund).

Each of these costs figures in the calculation of the resources needed to effect an equivalent program under a year-round and a traditional calendar. For example, implementing a program of basic instruction for 600 students requires classrooms, teachers, and utilities--among other resources. Given a staffing ratio of 30:1, 20 classrooms are required under a traditional schedule and 15 under a 45-15 year-round schedule (only 3/4 of the students are in school at any particular time). This difference of five classrooms is a saving in terms of annual capital expense (five classrooms do not have to be built) and operating expense (five classrooms do not have to be heated, cleaned, painted, etc.). On the other hand, to go to a year-round schedule, the school may have to install

air-conditioning equipment, an implementation expense and an operating expense (additional energy use during the summer and whenever else the air conditioning is used).

The Resource Requirements model (the model most commonly used in the educational evaluation literature) considers capital, operating, and transition costs. However, use of this complex model is not necessary in our situation, where only the schedule (not the program) changes.* Instead, we need only be concerned with the resources that change when the schedules change. Each such resource is discussed in depth in Chapter 3. The essential resource categories are:

Resource Category	Type of Cost Affected		
	Capital	Operating	Transition
Classrooms (including furnishings)†	x	x	x
Utilities		x	x
Teachers		x	x
School administrative staff		x	x
Transportation staff and buses	x	x	x

Summary--Assumptions Underlying the SRI Cost Model

To summarize, the approach we are taking enumerates the school- and district-level cost differences between the basic instructional program as implemented under a traditional schedule and a year-round schedule.

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*For each resource, the Resource Requirements model assigns standard costs based on national averages, considering the "amortized capital expense (a portion of the nonrecurring cost to acquire the resource) and the operating expense (the annual recurring cost of the resource)" (Rogers et al., 1977, p. 38). This method is needlessly complicated for our purposes. Because the decision-making audience consists of local officials (school principals, district administrators, and concerned citizens), national averages are not necessary. Our model presents operating cost differences in the budget categories with which the decision maker is familiar.

†Classroom furnishings change because, whereas desks, chairs, etc., can be shared under a year-round schedule, new furnishings are needed for new classrooms under TCS. Books and curricular materials are allocated on a per-pupil basis (in California) and therefore are not affected.

As applicable, we consider the capital costs, operating costs, and transition costs for each category of resources. The issues and problems discussed in previous sections of this chapter led us to make the following assumptions about the cost model needed for the PVUSD cost study:

(1) The best way to analyze the cost impact of a schedule change at a school is to compare the actual operation under one schedule with what it would have cost to operate the same school (and program) under the alternative schedule (i.e., a simulation). Foremost among the advantages of this procedure is the fact that it allows us to hold the educational process constant. Differences in costs do not have to be adjusted for site-specific factors.

(2) The unit of analysis is the school. A cost model should provide for assessment of the economic impact at both the school and the district levels. Since school-level data can be aggregated to the district (but the reverse is not necessarily possible), the school is the most appropriate unit of analysis for YRS cost studies.

(3) The comparison of YRS to TCS operating costs at a school must proceed on the basis that the same number of students are receiving the same basic instructional services. Holding enrollment constant has the same effect as presenting costs on a per-child, or ADA, basis. However, this technique avoids contamination by cost components that have a nonlinear relationship to student population (e.g., administrative costs that change as a step function).

(4) The model must make clear the consequences of policy changes. There seems to be a natural tendency for LEA policymakers to institute other changes concurrently with the shift to a year-round schedule (because the year-round calendar gives the district decision maker more options). It seems reasonable to insist that the basic comparison between schedule-related costs be made on the basis of an equivalent program for the same population. Realistically, however, we expect policymakers to want information about the cost consequences of policy changes concomitant with the shift in calendars. Therefore, our model must provide this additional information.

(5) The basic instructional program, used as the basis for comparison, is the program of classroom instruction mandated for all students for the term prescribed by law. (In the case of PVUSD and other California districts, this amounts to 240 minutes of instruction per day for 180 days per year.) This program does not include categorical programs (e.g., Title I), because these are usually not available to all students in a school.

3 THE SRI COST MODEL

The structural cost model developed for the PVUSD Cost Study is based on the five assumptions presented at the end of Chapter 2. This model relates background variables (planning factors beyond the immediate control of policymakers--e.g., the population served by the district) and policy variables (factors that educational policymakers can control--e.g., the staffing ratio at a school) to various cost outcomes (derived variables determined by the relationships among background and policy variables--e.g., the cost of classrooms "saved" if a school converts to a year-round schedule). The construction of the SRI cost model was influenced by a cost model of Norwegian Education (Magnussen, 1972) and the work of the SRI Decision Analysis Group (Staël von Holstein, 1973).

This study focuses on the deterministic phase of the classic decision analysis approach to problem solving. This phase has eight necessary steps (Staël von Holstein, 1973):

(1) Define the problem. Should this school continue operating under the same (i.e., year-round) schedule?

(2) Identify the alternatives. In this case, two alternatives are available: (1) remain on the year-round schedule, and (2) revert to a traditional schedule and construct new classrooms.*

(3) Establish the outcomes. Three categories of outcomes have been defined--capital costs, operating costs, and transition costs.

(4) Select variables relevant to the decision. We defined three categories of variables:

- Policy variables--factors over which the policymaker has control (also called decision variables); examples are pupil-teacher ratio and eligibility of pupils for transportation.

*A third alternative might also be considered--reverting to a traditional schedule and leasing portable classrooms to meet the need for additional space.

- Background variables--factors that the policymaker cannot control (also called exogenous or planning variables); an example is district enrollment.
- Derived variables--intermediate variables (also called endogenous variables) that result from interactions among policy and/or background variables; the number of classrooms required to serve the current enrollment is an example.

(5) Build a structural model that relates outcomes to the input (policy and background) variables. This model is a depiction of the relationships between inputs and outcomes. The SRI cost model assumes a multistage relationship in which the input variables interact to produce derived variables, which in turn interact with other variables to produce additional derived variables, and so on until the final set of relationships determines cost outcomes.

We have developed this model in three phases. In the first, we constructed the logical diagrams shown in Figures 3-1 through 3-5. These diagrams describe the primary interrelationships among variables that produce the outcomes. In the second phase, the relationships were described in mathematical form. Finally, the entire model was translated into a computer program.

(6) Determine the unit of value. For the various alternatives to be comparable, their outcomes must be expressed in equivalent terms. For the present study, we have defined the unit of value as the total cost of providing basic instructional services in a given school year for a particular number of students.

(7) Specify the decision time frame. The results of some decisions extend over a long period of time. The decision to build classrooms usually involves a commitment of funds over an extended period. We express these capital expenditures in terms of the annual payment of principal and interest that would be incurred if the construction were actually undertaken. (The same time frame and interest rate are used to annualize transition costs. We assume that transition expenses, like construction costs, are extraordinary expenditures; therefore, they should be handled in a similar manner.)

(8) Measure sensitivity to identify the critical background and policy variables. It is assumed that the various background and policy factors will have different impacts on intermediate and ultimate outcomes. The sensitivity analysis permits us to determine the extent of these impacts and to rank the variables of interest based on their power to affect outcomes. In the case of year-round schools, for example, the sensitivity analysis permits policymakers to simulate the impacts of changes in district policy and to determine enrollment levels at which expansion or reduction of the year-round program would result in lowered costs.

The literature on YRS costs suggests that five cost areas are usually affected when a school changes from a traditional to a year-round schedule:

(1) Classrooms and related furnishings--the school avoids the necessity of constructing and furnishing additional classrooms (a capital expenditure).

(2) Utilities--the school is open all year, requiring additional utilities in the summer; however, some utilities expenses are avoided because no new classrooms are constructed (operating expense).

(3) Teachers--because the school is open longer, teacher contracts may be affected (operating expense).

(4) School administrative staff--because the school is open all year, the staff requires longer contracts (operating expense).

(5) Transportation staff and buses--because of the year-round schedule, students must be transported on more days, requiring additional personnel and materials expense (operating cost); however, fewer buses may be needed (capital expenditure).

Each of these areas is incorporated in our model and expressed as an annual component cost, as follows:

(1) Classrooms--the amortized cost of avoided classroom construction and furnishing (that is, the total capital cost of building, furnishing, and financing these classrooms is calculated; this figure is then annualized--spread over a suitable period, with an equal share paid each year).

(2) Utilities--the incremental cost (i.e., the change in operating cost) associated with the calendar change.

(3) Teachers--the incremental cost.

(4) School administrative staff--the incremental cost.

(5) Transportation--the change in operating cost due to schedule-related changes in personnel and materials expenditures; the amortized cost of avoided bus purchase.

Figures 3-1 through 3-5 illustrate the interactions among background and policy variables that produce each component cost.*

*If this model is used retrospectively (e.g., as it was in the case of the PVUSD cost study), the derived costs displayed in these figures represent differences between actual costs incurred under a year-round schedule and simulated costs under a traditional calendar. If the same model is used to project costs (and savings) associated with a shift from TCS to YRS, the derived costs would represent differences between anticipated costs under the two schedules.

The model's sixth and final component is transition costs--the costs associated with conversion from a traditional to a year-round schedule. Normally these are one-time operating costs totally absorbed when incurred; however, they may be amortized if capital expenditures are involved (such as air conditioning). The six components are summed to find the total cost (or saving) of the calendar change. (This total cost figure can be easily converted to a per-pupil cost by dividing the total cost by the school enrollment--held constant over both calendars.)

Construction of Classrooms*

Figure 3-1 shows the interaction that produces the derived variable P_{Δ}--incremental classroom cost (the capital cost associated with the construction and furnishing of additional classrooms). This cost would be incurred if a school operating under a year-round schedule were to shift to a traditional calendar without decreasing the number of students served or modifying the instructional program. The background variables--planning factors--displayed in Figure 3-1 (number of classrooms at a school and classroom construction costs) are beyond the immediate control of policymakers. The policy variables (population served by YRS,† student-teacher ratio, number of classrooms assigned for purposes other than basic instruction) are factors that educational policymakers can control. The derived variables (number of classrooms needed for basic instruction, classrooms available for basic instruction, number of new classrooms needed, incremental classroom cost) are determined by the relationships among the background and policy variables.

The schematic of classroom costs provided in Figure 3-1 can be described as follows:

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*This component of the model assumes that if additional classrooms are needed they will always be built at the school. In Chapter 4 we discuss circumstances where new schools are necessary.

†Although Figure 3-1 treats the school population as a policy variable, the population served by the district is an exogenous (background) variable.

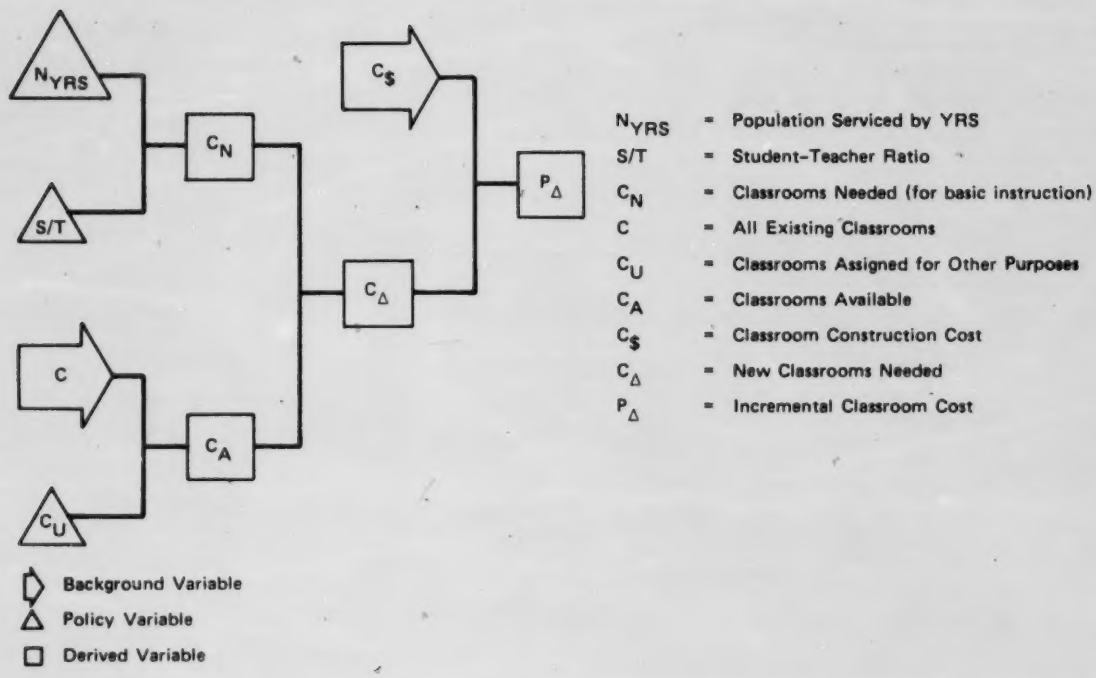

FIGURE 3-1 CAPITAL COSTS (At a School)

(1) $N_{YRS} \div S/T = C_N$

The population served (N_{YRS}) divided by the student-teacher ratio (S/T) determines the number of classrooms needed for basic instruction (C_N).

(2) $C - C_U = C_A$

The total number of classrooms available (C) less the number of classrooms assigned to functions other than basic instruction (C_U), which would include, for example, a classroom used as a reading laboratory funded by Title I, yields the number of classrooms available for basic instruction (C_A).

(3) $C_N - C_A = C_\Delta$

The number of classrooms needed minus the number of classrooms available gives us the number of new classrooms needed (C_Δ). This represents the number of classrooms that would have to be built (and furnished) if the school were to serve, on a traditional schedule, the population served by the school under a year-round schedule.

(4) $C_\Delta \times C_\$ = P_\Delta$

The number of new classrooms needed (C_Δ) times the cost for constructing a new classroom ($C_\$$)* produces the incremental classroom cost (P_Δ).

Figure 3-1 illustrates that a policy change regarding student-teacher ratio can have a significant effect on capital costs. For example, assuming a student population of 600, a shift from a 30:1 to a 27:1 staffing ratio increases the number of classrooms needed by two; 20 classrooms suffice for a 30:1 ratio, whereas 22 are required for a 27:1 ratio. However, a policy change regarding the number of classrooms not assigned to basic instruction has a more direct effect. Assuming that 20 classrooms are needed, if 18 are used for basic instruction and 2 are used as a library/learning center, then a decision to use the 2 classrooms for instruction will result in avoiding the costs of constructing 2 classrooms. (However, there are opportunity costs† associated

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*Includes construction, furnishing, and financing costs.

†At several points we discuss opportunity costs--the worth of a resource in its most productive use, considered in determining its cost in a particular application. These costs are not incorporated in the model, since to do so would violate the assumption of comparable programs under both calendars. (See Chapter 6 for consideration of some opportunity costs relevant to YRS.)

with this reassignment of the 2 classrooms. The educational services provided are not the same without the library/learning center; this violates the principle expounded in Chapter 2 that the evaluation of the costs of the calendar change must compare equivalent educational programs. Also, the 2 classrooms may be better suited for this use than for basic instruction.)

Utilities

Figure 3-2 is a schematic of utility costs. The critical question is: What utilities would or would not have been used if this year-round school had been operated on a traditional schedule? Traditional schools are not usually operated in the summer. Therefore, one way to calculate the incremental utilities expense for a school is to sum the utilities used during the months when the school normally would not be in session. However, there are several problems with this procedure:

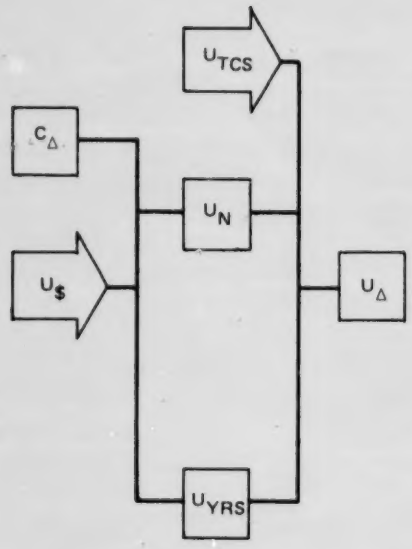
- Some utilities are required for maintenance and other purposes even during the months when schools are closed.
- Schools are usually not closed or opened at times that correspond to the utility billing periods.
- As the total utility demand increases, the school may be put on a different rate schedule by the utility company.
- Sometimes the change to a year-round schedule necessitates new appliances, such as air conditioning, which themselves change utility usage.

The components in Figure 3-2 are combined to compare actual YRS utilities charges with the simulated TCS charges. The simulated charges are computed as follows:

(1) The yearly charges are computed for utilities for the existing school as if it were operating on a traditional schedule (U_{TCS}). (Three ways of determining these charges are described in Volume III, Cost Analysis Handbook.)

(2) The incremental change in utilities cost that would be incurred if the school reverted to a traditional schedule and built new classrooms is computed as

$$C_{\Delta} \times U_{\$} = U_{N} \quad ,$$



C_Δ = New Classrooms Needed

U_{TCS} = Utilities Charge for TCS

U_N = Utilities Charge for New Classrooms

$U_\$$ = Utilities Charge per Classroom

U_{YRS} = Utilities for YRS

U_Δ = $U_{TCS} + U_N - U_{YRS}$
Incremental Utilities Cost Change from TCS to YRS (serving same population N)

FIGURE 3-2 UTILITIES COSTS

where

C_Δ = New classrooms needed (see Figure 3-1)

$U_\$$ = Utilities charge per classroom ($U_{TCS} \div C$--see Figure 3-1)

U_N = Incremental utilities cost associated with new classrooms.

(3) The current utilities cost for the school operating under a year-round schedule is U_{YRS}. (This may include additional utilities charges due to air conditioning.)

(4) The incremental change in the utilities cost attributable exclusively to schedule is

$$\left(U_{TCS} + U_N\right) - U_{YRS} = U_\Delta \quad ,$$

where

U_{TCS} = Utilities charges for existing classrooms under traditional schedule

U_N = Utilities charge for new classrooms

U_{YRS} = Utilities charge under year-round schedule

U_Δ = Incremental utilities cost.

Teachers

Figure 3-3 illustrates that the determination of the incremental cost of teacher compensation* under YRS involves several calculations:

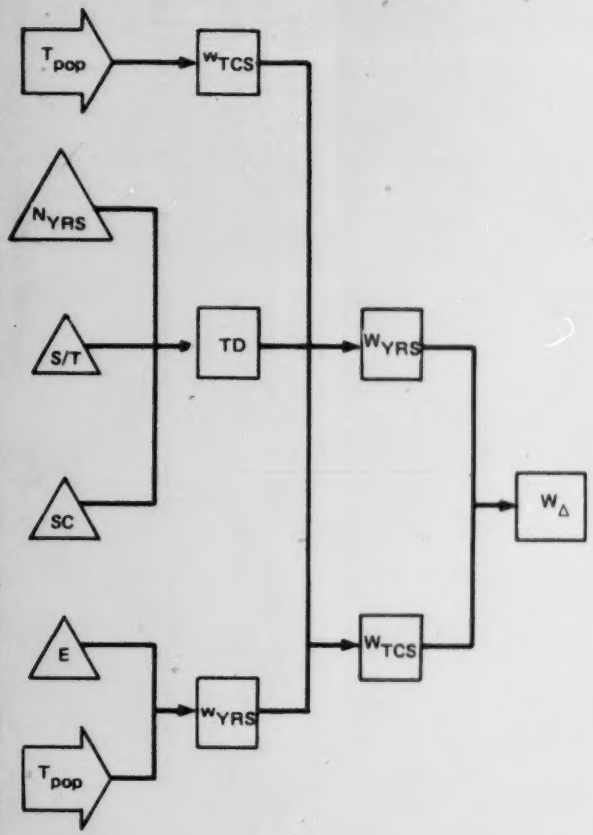
(1) $N_{YRS} \div S/T \times SC = TD$

Dividing the student population served by YRS (N_{YRS}) by the student-teacher ratio (S/T) and multiplying the result by the standard contract length (SC) yields the total required teaching days (TD).

(2) The average daily compensation under TCS (w_{TCS}) is a function of the compensation of the teacher population (T_{pop}).

$$w_{TCS} = \frac{1}{T_{pop}} \sum_{i=1}^{T_{pop}} w_i/SC$$

*The term "compensation," as used here, includes both salaries and fringe benefits.



T_{pop} = Teacher Population at a School
w_{TCS} = Average Daily Compensation for TCS Teacher
N_{YRS} = Student Population
S/T = Student-to-Teacher Ratio
SC = Standard Contract Length
TD = Total Teaching Days Required
W_{TCS} = Total Annual Teacher Compensation Under TCS
E = District Policy on Contract Extension
w_{YRS} = Average Daily Compensation for YRS Teacher
W_{YRS} = Total Annual Teacher Compensation Under YRS
W_{Δ} = Incremental Cost of Teacher Compensation

FIGURE 3-3 TEACHER COMPENSATION

where

T_{pop} = The number of teachers

w_i = Annual compensation for the i^{th} teacher

SC = Standard contract length.

(3) $w_{TCS} \times TD = W_{TCS}$

The average daily compensation under TCS (w_{TCS}) multiplied by the total required teaching days (TD) yields the total annual teacher compensation under TCS (W_{TCS}).

(4) The average daily compensation under YRS (w_{YRS}) is a function of the compensation of the teacher population (T_{pop}) and of the district policy on contract extension.

$$w_{YRS} = \frac{1}{T_{pop}} \sum_{i=1}^{T_{pop}} w_i / C_i \quad ,$$

where

T_{pop} = The number of teachers

w_i = Annual compensation for i^{th} teacher

C_i = Contract length of i^{th} teacher (if no contract extension, C_i = SC).

(5) $w_{YRS} \times TD = W_{YRS}$

The average daily compensation under YRS (w_{YRS}) multiplied by the total required teaching days (TD) yields the total annual teacher compensation under YRS (W_{YRS}).

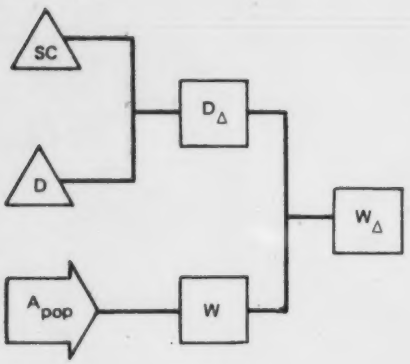
(6) $W_{TCS} - W_{YRS} = W_{\Delta}$

The total annual teacher compensation under TCS minus the total annual teacher compensation under YRS equals the incremental cost.

If the LEA does not permit contract extensions, there will be no difference between W_{TCS} and W_{YRS}. If extensions are permitted, the difference between W_{TCS} and W_{YRS} is a function of the salaries of both those teachers who select to extend their contracts and those who choose to work less than standard contracts (because of various lengths of contract extension, there will be periods available for teachers who want to work irregular contract lengths).

School Administrative Staff

Figure 3-4 illustrates cost differences associated with nonteacher personnel (administrative and classified personnel such as principals, secretaries, and custodians). Basically, changes in staff costs are a function of contract extensions required for each personnel category.



SC = Standard Contract for Nonteacher Personnel
D = Days in Session Under YRS
D_Δ = Change in Contract Days
A_{pop} = Nonteacher Personnel Available
W = Average Daily Compensation
W_Δ = Change in Total Annual Compensation for Nonteacher Personnel

FIGURE 3-4 SCHOOL ADMINISTRATION STAFF COMPENSATION

How much longer the nonteaching staff work depends on the difference between the length of their standard contracts and the number of days YRS is in session. For example, if a principal already has a 12-month contract, no extension is needed (however, principals will perform different tasks during the summer, so that an opportunity cost is incurred). Nonteacher cost differences are calculated as follows:

(1) $D_\Delta = f(SC, D)$

The change in contract days (D_Δ) for nonteaching staff members is a function of their original contract length (SC) and the number of days school is in session under YRS (D).

(2) $W = f(A_{pop})$

Average daily compensation (W) is a function of the available nonteacher personnel (A_{pop}).

(3) $W_{\Delta} = \sum_{i=1}^{A_{pop}} W_i \times D_{\Delta_i}$

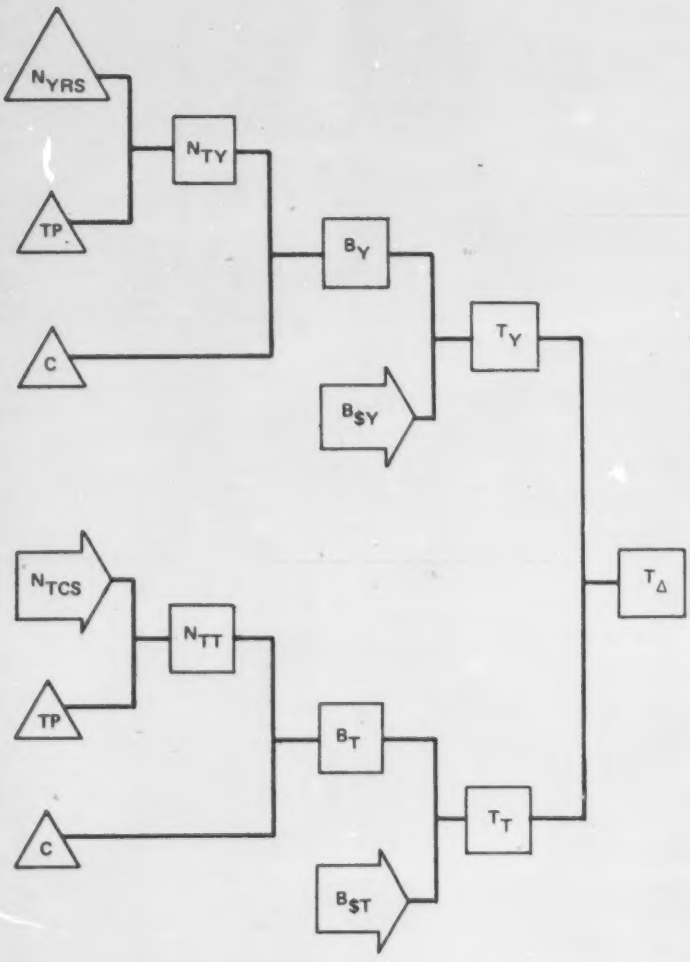
The change in total annual compensation (W_{Δ}) is the sum over all nonteaching personnel of their average daily compensation (W) times the number of days their contracts are extended (D_{Δ}).

Classified salaries include the account for maintenance and operation salaries. This is handled like the other contract extensions discussed above; i.e., a custodian may work a 12-month contract under YRS instead of a 10-month contract. At the Pajaro Valley Unified School District, custodians usually work a 12-month contract (regardless of school schedule). However, there are schedule-related differences in the work assignments of the custodians.

- Under a traditional schedule, the "deep cleaning" of light fixtures, upper walls, and relatively inaccessible areas is accomplished during the summer. Since the 45-15 plan does not include an extended period during which all students are out of school, the intensive cleaning is spread over the calendar year. The district maintenance supervisor indicated that basic cleaning is performed under YRS but that this deep cleaning is not accomplished as thoroughly as in TCS. He remarked that if the entire district were to go on a year-round schedule, he would need a two- or three-man crew to go from school to school and perform this deep cleaning.
- The year-round schools often need extra custodial help during a "track change" (every 3 weeks). Moving a teacher's materials from one classroom to another (or to storage) necessitates additional custodial help. (This also represents an opportunity cost for teachers, who often devote half of a teaching day and their own time to moving materials.)
- During the summer months, the year-round schools have to hire substitutes for absent custodians. At Pajaro, if a TCS custodian with a 12-month contract is absent during the summer, no substitution is made (because there is no urgency associated with the cleaning duties). If the custodian at YRS is absent during the summer, a substitute is found.

Transportation

Transportation salaries include those for bus drivers and transportation yard personnel (supervisors, dispatchers, mechanics, and the like). The number of bus drivers and yard personnel is a direct function of the number of buses. Figure 3-5 shows the relationships of the significant variables. Transportation costs are calculated as follows:



N_{YRS} = Population Served by a School Under YRS
TP = District Transportation Policy
N_{TY} = Number of Students Transported Daily (YRS)
C = District Policy on Bus Capacity
B_Y = Buses Needed (YRS)
$B_{\$Y}$ = Bus Costs per Year (YRS)
T_Y = Transportation Costs Under YRS
N_{TCS} = Population Served by School Under TCS
N_{TT} = Number of Students Transported Daily (TCS)
B_T = Buses Needed (TCS)
$B_{\$T}$ = Bus Costs per Year (TCS)
T_T = Transportation Costs Under TCS
T_Δ = Incremental Yearly Transportation Costs (TCS to YRS)

FIGURE 3-5 TRANSPORTATION COSTS

(1) $N_{TY} = f(N_{YRS}, TP)$

The number of students at a school transported daily under YRS (N_{TY}) is a function of the total population at the school (N_{YRS}) and the district transportation policy (TP).

(2) $B_Y = f(N_{TY}, C)$

The number of buses needed under YRS is a function of the number of students transported daily (N_{TY}) and the district policy on bus capacity (C).

(3) $B_Y \times B_{\$Y} = T_Y$

The number of buses needed (B_Y) times bus costs per year ($B_{\$Y}$) equals transportation costs under YRS.

(4) $N_{TT} = f(N_{TCS}, TP)$

The number of students at a school transported daily under TCS (N_{TT}) is a function of the total population at the school (N_{TCS}) and the district transportation policy (TP).

(5) $B_T = f(N_{TT}, C)$

The number of buses needed under TCS is a function of the number of students transported daily (N_{TT}) and the district policy on bus capacity (C).

(6) $B_T \times B_{\$T} = T_T$

The number of buses needed (B_T) times bus costs per year ($B_{\$T}$) equals transportation costs under TCS.

(7) $T_Y - T_T = T_\Delta$

Transportation costs under YRS (T_Y) minus transportation costs under TCS (T_T) yields the incremental YRS transportation costs (T_Δ).

Under a year-round schedule not all of the students will be in school on a particular day. Thus, the number of students to be transported (N_{TY}) will be less than the number that would be transported if they all were in school (N_{TT}). [However, the way the district schedules its buses can affect this situation; for example, a district might run buses for TCS at 100% theoretical capacity and run buses for YRS at 75% capacity.* In this case there would be no difference in the number of buses needed (B_Y and B_T). Therefore, the transportation cost for YRS would be greater

*Our assumption of equivalent programs under YRS and TCS includes equivalent policies regarding bus capacity.

than the transportation cost for TCS because the same number of buses would be in use for a greater number of days during the year.]

A hypothetical example illustrates these trade-offs. Suppose a district has eight schools serving 4,000 students, 3,000 of whom are transported by 40 buses (average capacity 75). If the district converts to a 45-15 schedule, only 3,000 students are in school at any one time, and 2,250 require transportation. Only 30 buses are now required.

If the 10 buses are actually eliminated, the affected accounts are:

- Transportation salaries--10 fewer bus drivers are required, but the remaining drivers work all year. Drivers with higher seniority tend to be retained.
- Employee benefits--these accounts are affected by the change in salaries.
- Transportation supplies--there are 10 fewer buses but the remaining 30 are driven more miles; this combination affects gasoline consumption and bus maintenance supplies.
- Equipment replacement--the reduction of 10 buses affects the annual outlay for bus lease or purchase.

If the average driver works 5 hours per day for 180 days under TCS and for 240 days under YRS, then the reduction of 10 drivers has no effect on total hours:

- 40 drivers x 5 hours x 180 days = 36,000 hours
- 30 drivers x 5 hours x 240 days = 36,000 hours.

However, cost per hour may rise if the more expensive drivers are retained. It is also possible that drivers may work more hours per day under YRS if fewer buses are used to cover the same territory. This is a direct function of district policy on transportation and bus capacity.

A reduction of 10 buses may have a nonlinear effect on transportation yard personnel. Certainly, some personnel will no longer be necessary; however, the "surplus" is difficult to predict. Historically, mechanics at Pajaro worked 12-month contracts and performed "heavy maintenance" (e.g., engine overhauls) in the summer. Under YRS these operations are performed on a time-available basis.

Transition Costs

The cost of converting from one calendar to another involves planning, in-service training, purchase of instructional/curriculum materials and supplies, evaluation, and equipment costs (see Cost Analysis Handbook, Chapter 4). If substantial, these costs may be amortized over several years.

Summary of Cost Components

Figure 3-6 summarizes the primary cost variables included in the model. Although they do not appear in Figure 3-6, there are seven important policy variables that affect costs; these variables and their primary influences can be summarized as follows:

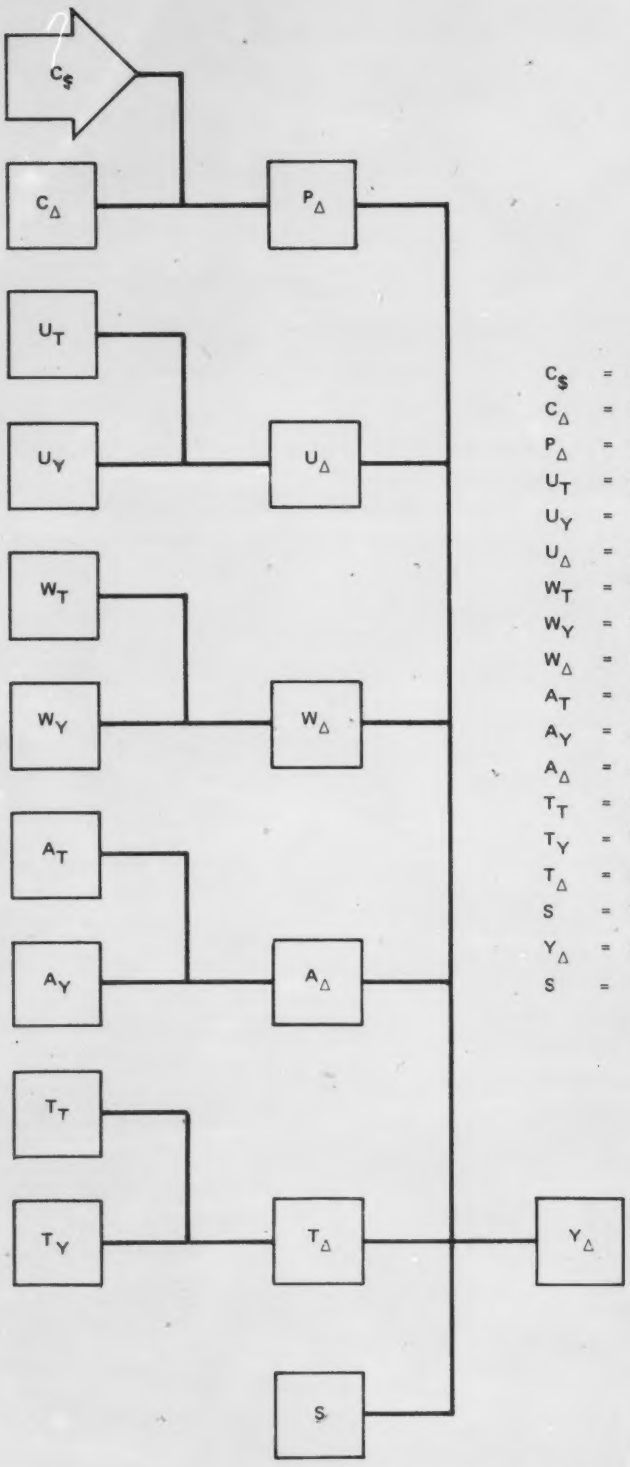
- Staffing ratio--A change in staffing ratio affects the classroom savings realized under YRS, and also affects the number of teachers required.
- Classrooms assigned for other purposes--If the use of classrooms changes as a school shifts from TCS to YRS, then the classroom savings are affected (the educational program is also affected).
- Days in session under YRS--The longer school is in session, the higher the nonteacher personnel costs will be.
- Standard contract length--The length of standard teacher and nonteacher personnel contracts under a traditional schedule affects the savings a year-round schedule can provide.
- Contract extension--The district policy on teacher contract extensions affects the certificated personnel costs under YRS.
- Transportation--If the district changes its policy about which children are eligible to be transported, the change will affect the potential transportation savings under YRS.
- Bus capacity--If the district changes its policy about the average daily capacity of buses (whether they should be run at 80%, 90%, or 100% capacity), the change will affect transportation savings under YRS.

The sources of input data for the SRI cost model are:

(1) Reports of actual expenditures (e.g., a report that shows the amount spent on utilities during the last fiscal year).

(2) Attendance data.

(3) School floor plans, annotated to show the use made of each classroom.



$C_{\$}$ = Construction Cost Per Classroom
C_{Δ} = Number of Classrooms Needed
P_{Δ} = Cost of New Classrooms
U_T = Utilities Cost Under YRS
U_Y = Utilities Cost Under TCS
U_{Δ} = Incremental Change in Utilities Cost
W_T = Teacher Compensation Under TCS
W_Y = Teacher Compensation Under YRS
W_{Δ} = Incremental Cost of Teacher Compensation
A_T = Administrative Compensation Under TCS
A_Y = Administrative Compensation Under YRS
A_{Δ} = Incremental Change in Administrative Compensation
T_T = Transportation Costs Under TCS
T_Y = Transportation Costs Under YRS
T_{Δ} = Incremental Change in Transportation Costs
S = Transition Cost
Y_{Δ} = Incremental Cost Change Due to YRS
S = Transition Cost

FIGURE 3-6 SUMMARY OF THE MODEL

(4) School staffing plans.

(5) Other LEA records.

Figure 3-7 provides a schematic overview of the basic procedures used by the SRI cost model to determine the fiscal impacts of a year-round school program. The forms used to collect the relevant data, and procedures for their use, are described in detail in the Cost Analysis Handbook.

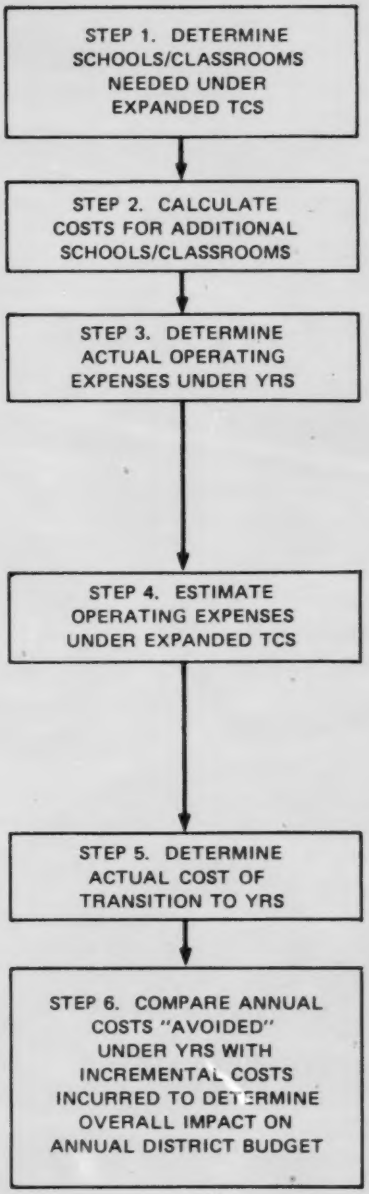

STEP 1. DETERMINE SCHOOLS/CLASSROOMS NEEDED UNDER EXPANDED TCS
STEP 2. CALCULATE COSTS FOR ADDITIONAL SCHOOLS/CLASSROOMS
STEP 3. DETERMINE ACTUAL OPERATING EXPENSES UNDER YRS
STEP 4. ESTIMATE OPERATING EXPENSES UNDER EXPANDED TCS
STEP 5. DETERMINE ACTUAL COST OF TRANSITION TO YRS
STEP 6. COMPARE ANNUAL COSTS "AVOIDED" UNDER YRS WITH INCREMENTAL COSTS INCURRED TO DETERMINE OVERALL IMPACT ON ANNUAL DISTRICT BUDGET

FIGURE 3-7 SUMMARY OF PROCEDURES USED IN THE SRI COST ANALYSIS MODEL

4 APPLICATION OF THE COST MODEL

In Chapter 3 we formally presented the SRI model for assessing the cost impacts of YRS. In this chapter we use the model to evaluate the budgetary impacts of the year-round program at PVUSD. We focus here on costs at the district level (and relate them with the original district estimates). However, most data are collected at the school level; in Appendix B we present an analysis of cost impacts at Amesti Elementary School as an example of a school-level analysis.

The results of our cost analysis are presented in three sections:

- Capital costs--what classroom construction and finance costs, if any, were avoided by operating the five schools on a year-round schedule?
- Operating costs--what incremental costs were incurred as a result of YRS? How do these costs compare with the operating expenses that would be incurred if the year-round schools were in use for only 9 months and additional classrooms were provided to house the surplus students?
- Transition costs--what one-time costs were incurred in the change from a traditional to a year-round calendar?

Capital Costs

The original estimate of capital costs that would be avoided by introduction of a district-wide year-round program in PVUSD appeared in the report of the Pajaro Valley Year-Round School Study Commission, submitted to the district's Governing Board in January 1972, as shown in Table 4-1. The Commission calculated that the interest to finance this construction cost through 20-year bonds at 5% would amount to $5,335,350,* bringing the total classroom construction cost to $12,585,350. Classroom furnishings and equipment were expected to add $616,250 to the total cost.

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*We calculate the expected bond interest at $4,385,372.

Table 4-1

PVUSD ESTIMATE OF CAPITAL COSTS AVOIDED BY YRS

Date	Annual Enrollment Increase	Projected Enrollment	Enrollment Over (Under) Capacity		Construction Cost Required to House Regular School Enrollment
			Regular School*	Year-Round	
10-1-71		13,028 (act.)	1,769	(1,934)	$3,335,000
9-1-72	391	13,419	2,160	(1,593)	737,400
9-1-73	403	13,822	2,563	(1,190)	760,000
9-1-74	415	14,237	2,978	(775)	782,600
9-1-75	427	14,664	3,405	(348)	805,300
9-1-76	440	15,104	3,845	(92)	829,700
					$7,250,000

*Nine-month school calendar.

Source: PVUSD, 1972

In January 1974, PVUSD issued a "First-Year Report" on the YRS program. The savings to the district cited in this report were more modest (because only 5 of the schools had been converted to YRS):

> ... a realization of 30.6 additional classrooms in the five schools involved in 45-15 scheduling. At the 1973 construction costs of $27,000 per room, the district has eliminated the need for building expenditure totaling $826,000 [not including debt service]. (PVUSD, 1974)

Our estimate of the impact of PVUSD's year-round school program on capital expenditures is based on 1975-76 enrollment and cost figures. The procedure that we followed assumes that a school can serve more students under a 45-15 calendar than it can under the traditional 9-month schedule and that construction of new classrooms would therefore be necessary if the district reverted to exclusive use of the 9-month schedule. The saving in capital costs offered by YRS equals the cost for providing

additional facilities necessary to serve the overflow under TCS (including construction and finance costs).*

Table 4-2 shows current enrollment and use of space at each of the district's five year-round schools. Current (i.e., YRS) use of classroom space is compared with a projection of classroom requirements and availability if the schools reverted to the traditional calendar. For example, Amesti school has 16 classrooms; under YRS, 14 are used for basic instruction and 2 are used for a library/learning center. If the school reverted to a 9-month calendar, we assume that classrooms would have the same use they do now. Classroom space would then be inadequate to house the 548 students served under YRS.

Specifically, Amesti serves a kindergarten enrollment of 80 with one kindergarten classroom. Each day, two classes of approximately 27 students each use this classroom--one in the morning and one in the afternoon. If the school reverted to a traditional schedule, a second kindergarten room would be needed for morning or afternoon use to maintain the current class size. A total of 468 students are enrolled in grades 1 through 6. Dividing 468 by the staffing ratio of 29 yields 16.14 classrooms needed for these grades under TCS. In all, 18 classrooms would be needed under TCS to house Amesti's enrollment--4 more than are available at this school.

Following this procedure at the other 4 year-round schools, we estimate that PVUSD has "saved" a total of 16 classrooms. Five of these are intermediate classrooms at Rolling Hills Junior High School, and 11 are elementary classrooms.

We assume that the district would build a new elementary school (on land already available)† to provide the 11 elementary classrooms and add 5 new rooms to the junior high school. Our calculation of the cost of

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*A more detailed discussion of procedures used to estimate these costs is provided in Chapter 3 of the Cost Analysis Handbook.

†We estimate that this land would have cost $211,862 if purchased in 1974-75. Having the site available saved $19,210 per year on an amortized basis.

Table 4-2

CLASSROOM USE AT PVUSD YEAR-ROUND SCHOOLS

YRS Classroom Use	Amesti						Calabasas						Freedom						Hyde						Subtotal					
	K	1-6	7-8	9-12	Special	Total	K	1-6	7-8	9-12	Special	Total	K	1-6	7-8	9-12	Special	Total	K	1-6	7-8	9-12	Special	Total	K	1-6	7-8	9-12	Special	Total
(1) Available Classrooms	1	15				16		12				12	2	19			1	22	1	11			1	13	4	57			2	63
(2) In Use Single Session	1	13				14		12				12	2	15			1	18	1	11			1	13	4	51			2	57
(3) In Use Double Session (× 2)*	0	0				0		0				0	0	0			0	0	0	0			0	0	0	0				
(4) Surplus Classrooms	0	2				2		0				0	0	4			0	4	0	0			0	0	0	6			0	6
YRS Surplus Use																														
(5) Compensatory Education		0				0		0				0		2				2		0				0		2				2
(6) Vocational Education		0				0		0				0		0				0		0				0		0				0
(7) Migrant		0				0		0				0		0				0		0				0		0				0
(8) Bilingual		0				0		0				0		0				0		0				0		0				0
(9) Library		2				2		0				0		0				0		0				0		2				2
(10) Other		0				0		0				0		2				2		0				0		2				2
TCS Surplus Use																														
(11) Available Classrooms	1	15				16		12				12	2	19			1	22	1	11			1	13	4	57			2	63
(12) Same Surplus Use--TCS	0	2				2		0				0	0	2			0	2	0	0			0	0	0	4				4
(13) Net Available--TCS	1	13				14		12				12	2	17			1	20	1	11			1	13	4	53			2	59
TCS Classroom Use																														
(14) Enrollment Served	80	468				548		448				448	101	537			8	646	62	374			12	438						
(15) Staffing Ratio	55	29						29				29	55	29			8	-	55	29			12	-						
(16) Classrooms Needed	2	16				18		15				15	2	19			1	22	1	13			1	15						
(17) Net Available--TCS	1	13				14		12				12	2	17			1	20	1	11			1	13						
(18) Classroom Deficit	1	3				4		3				3	0	2			0	2	0	2			0	2	1	10				11

*Other than conventional double-session kindergarten.

Table 4-2 (Concluded)

YRS Classroom Use	Rolling Hills																						District Total					
	K	1-6	7-8	9-12	Special	Total	K	1-6	7-8	9-12	Special	Total	K	1-6	7-8	9-12	Special	Total	K	1-6	7-8	9-12	Special	Total	K	1-6	7-8	9-12	Special	Total
(1) Available Classrooms			19			19																			4	57	19		2	82
(2) In Use Single Session			18			18																			4	51	18		2	75
(3) In Use Double Session (× 2)*			0			0																			0	0	0		0	0
(4) Surplus Classrooms			1			1																			0	6	1		0	7
YRS Surplus Use																														
(5) Compensatory Education			0			0																				2	0			2
(6) Vocational Education			0			0																				0	0			0
(7) Migrant			.5			.5																				0	.5			.5
(8) Bilingual			0			0																				0	0			0
(9) Library			0			0																				2	0			2
(10) Other			.5			.5																				2	.5			2.5
TCS Surplus Use																														
(11) Available Classrooms			19			19																			4	57	19		2	82
(12) Same Surplus Use--TCS			1			1																			0	4	1		0	5
(13) Net Available--TCS			18			18																			4	53	18		2	77
TCS Classroom Use																														
(14) Enrollment Served			588			588																								
(15) Staffing Ratio			26			26																								
(16) Classrooms Needed			23			23																								
(17) Net Available--TCS			18			18																								
(18) Classroom Deficit			5			5																			1	10	5		0	16

*Other than conventional double-session kindergarten.

this construction effort is shown in Tables 4-3 and 4-4. We estimate the cost for the new elementary school (in 1975 dollars) as $970,589 and the cost for the Junior high classrooms as $554,124.

Table 4-3

ESTIMATED COSTS FOR CONSTRUCTION OF A NEW ELEMENTARY SCHOOL

Classroom Type	Children Served	x	Square Feet per Child	=	Total Square Feet
Kindergarten	29*		55		1,595
1-6	290		55		15,950
7-8					
9-12					
Total					17,545

Total Square Feet	x	Cost per Square Foot	=	Total Cost
17,543		$55.32		$970,589.40

*Adjusted for double session.

Table 4-4

ESTIMATED COSTS FOR CONSTRUCTION OF FIVE JUNIOR HIGH SCHOOL CLASSROOMS

Type of Classroom	Number Required	Children per Class	Square Feet per Child	Total Square Feet	Dollars per Square Foot	Total Cost
Kindergarten						
1-6						
7-8	5*	26	75	9,750	$56.83	$554,124.27
9-12						

*Rolling Hills Junior High School.

Thus, the total saving in construction costs realized by PVUSD's year-round use of five school plants is $1,524,714. We assume that this amount would be financed through issuance of a 20-year bond at 6% interest, with a bond broker's fee of 4%. (These figures were relatively common for this section of California during the 1975-76 period.) Our calculation of the total capital cost is shown in Table 4-5. The total outlay of $2,764,597 over 20 years represents an annual payout of $138,248.*

Table 4-5

TOTAL CAPITAL COSTS AVOIDED AND ANNUAL PAYOUT

(1)	PRINCIPAL	$ 1,524,714†	
(2)	BOND BROKER'S FEE	60,989	
(3)	TOTAL BOND AMOUNT (Line 1 + Line 2)		$ 1,585,703
(4)	ANNUAL PAYMENT		
	4a. Bond Life	20 years	
	4b. Bond Interest Rate	6%	
	4c. Present Value	11.47	
	4d. Annual Payment (Line 3 ÷ Line 4c)		$ 138,247.87
(5)	TOTAL PAYOUT (Line 4 × Line 4d)	$ 2,764,957	
(6)	TOTAL BOND INTEREST (Line 5 - Line 3)	$ 1,179,254	

†This amount does not include site acquisition.

*The annual cost of $138,248 is used as the cost of new classrooms (P_{Δ}) in our model.

Our estimate of $2,764,597 in capital costs avoided is 22% of the PVUSD Study Commission's original district-wide projection of $12,585,350. This disparity is due primarily to the fact that only five schools converted to a year-round system, because the expected increases in student enrollment did not materialize. Enrollment had been increasing rapidly during the 1950s and 1960s, and the Commission expected this growth to continue at an annual rate of 3%. In fact, after 1971 enrollment remained relatively constant. The Commission's report does not specify the number of classrooms that would be "gained" through conversion to YRS, but housing the 3,845 excess students projected through 1977 would have required well over 100 classrooms. As indicated earlier, our analysis concludes that the actual number of classrooms gained was 16.

A related question is whether the savings to the district would increase if YRS were expanded beyond the five schools currently participating. In the case of PVUSD, it appears that the current program is adequate to relieve overcrowding at the elementary and junior high school levels, so that the answer is no. Expansion of YRS to additional schools would increase the potential number of students who could be served within the existing facilities. However, as long as the schools currently operating under the traditional schedule are not overcrowded, converting them to year-round use would result mainly in the availability of surplus classrooms not needed for basic instruction. In terms of capital costs, expansion of the program would result in further savings only if district policies (e.g., staffing ratio) changed, if enrollment increased, or if existing facilities were closed or converted to other use.

Operating Costs

YRS Incremental Operating Costs

The PVUSD Year-Round Study Commission estimated that conversion to a year-round schedule would result in the following increases to annual district operating costs:

Budget Category	Estimated Increase
Administration	$ 3,000
Instruction and special services	24,630
Clerical	10,567
Maintenance and operations	9,533
Total estimated increases	$47,730

Within the administration category, the Commission included costs for planning, scheduling, evaluation, community relations, extension of principals' contracts from 10 to 12 months, and allowances for sick pay.

The estimated increase in instruction and special services costs covered contract extensions for teachers, the coordinator of special services, psychologists, psychometrist, district child welfare and attendance personnel, and the like, as well as additional data processing costs (for determining attendance areas, bus routes, etc.).

The clerical category covered contract extensions for school secretaries and other school or district clerical employees, and allowances for additional vacation relief; the estimated increase reflects the elimination of some summer school secretarial positions.

The maintenance and operations estimate included vacation relief for custodians, an allowance for a crew to accomplish the major cleaning normally completed during the summer, and increased utilities costs expected to result from keeping schools open for 12 months.

Our analysis of PVUSD operating costs indicates that the year-round program resulted in a saving of $13,393 in 1975-76. The explanation for the difference between PVUSD's projection of an increase in operating costs and our identification of a net saving is simple: The procedure that we followed compares operating costs that are directly attributable to the year-round calendar to an estimate of the costs that would be incurred for operating the additional elementary school and junior high classrooms required by our TCS simulation.* This method allows for the

*A detailed discussion of procedures for determining the impact of YRS on operating costs is provided in Chapter 4 of the Cost Analysis Handbook.

possibility that some operating costs are higher under YRS and others are higher under the TCS simulation. The PVUSD Study Commission, on the other hand, looked only at the incremental costs that would result from a shift to YRS; it did not take into account the costs of salaries, benefits, and utilities, and the other operating expenses that would result from building more classrooms. Under these circumstances, the Commission had to find an increase.

PVUSD operating costs directly attributable to the year-round calendar during the 1975-76 school year are displayed in Table 4-6, and in greater detail in Appendix C. These costs can be itemized as follows.*

Table 4-6

YRS INCREMENTAL OPERATING COSTS

Accounting Category		Year-Round Costs (Only)
1000	Certificated Salaries	$129,648
2000	Classified Salaries	28,867
3000	Employee Benefits	10,521
4000	Books, Supplies, and Equipment Replacement	12,042
5000	Contracted Services	47,643
6000	Sites, Building	--
7000	Other Outgo	--
	Total	$228,721

Account 1000: Certificated Salaries ($129,648)--Incremental costs of YRS under this account cover contract extensions for teachers and other certificated personnel. The following accounts were affected:

*The accounting categories shown are those used in California for budgeting and financial reporting. Districts in other states may need to examine their budgets on a line-item basis to combine costs into the seven categories used in our model.

- 1100--Teachers' Salaries--$103,964

  This account covers the incremental costs of nonstandard teaching contracts required by the year-round schedule. It includes both the salary costs associated with contract extensions and the salaries paid to teachers hired under contracts shorter than the standard for the year-round program. The YRS incremental cost figure is derived from the actual salaries of the personnel involved.

- 1200--School Administration Salary--$14,113.85

  Five school principals and one half-time vice-principal extended their contracts from 204 to 226 days. At each school, the principal is absent for several days during the year while the school is in session. At four schools, these absences are covered by the assignment of a head teacher. Again, YRS incremental costs are calculated using actual salaries of the personnel involved.

- 1500--Guidance Salaries--$11,570

  YRS incremental costs under this account cover contract extensions for a guidance counselor, a psychologist, and two speech therapists.

- 1600--Health Services Salaries--$0

  There were no incremental costs under this account. Nurses were not available to the year-round schools during several periods of the year.

- 1700--Administration--$0

  In PVUSD's original projection, this account showed an increase to cover extended contracts for the coordinators of special services and child welfare and attendance. These two positions have recently been consolidated into one 12-month position (Head of Special Services). We no longer consider this an incremental cost associated with the year-round schedule.

Account 2000: Classified Salaries ($28,867)--This account covers contract extensions and salaries for additional classified personnel required by the year-round schedule. At PVUSD, teacher aides are usually paid from categorical funds (e.g., Title I); for this reason, there is no incremental cost to the district for aides. The accounts in which incremental costs are incurred are:

- 2300--Clerical Salaries
2400--Maintenance and Operation Salaries } $15,888

  The incremental costs for these accounts include contract extensions for one or more secretaries at each year-round school and

provision for additional custodial help. Incremental custodial costs ranged from provision of replacement or overtime custodial support during the summer to an increase in the number of hours worked daily by a custodian.

- 2600--Transportation Salaries--$12,979

  Ten drivers extended their contracts from 175 days to 235 days.

Account 3000: Total Employee Benefits ($10,521)--This account covers increases in employee benefits (retirement, health and life insurance, long-term disability insurance, workers' compensation) attributable to YRS. As such, it includes increased benefits resulting from contract extensions and benefits paid to additional personnel.

Account 4000: Books, Supplies, and Equipment Replacement ($12,042)--The only category under this account with expenses directly attributable to the year-round schedule is Transportation Supplies (account 4600). Before 1976, detailed records of transportation costs were not maintained in PVUSD. Therefore, with the assistance of district transportation and accounting personnel, we estimated YRS incremental costs as follows:

- Ten buses serve the five year-round schools; the average total miles driven per day for these buses is 669.
- Buses are in operation 60 additional days per year under the year-round schedule (235 - 175).
- PVUSD reckons gasoline, oil, and transportation yard overhead costs at 30¢/mile.
- YRS incremental costs are calculated as:

  60 days x 669 miles x $0.30 per mile = $12,042 .*

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*Thus we calculate the total incremental cost of transportation as $25,020: $12,042 for transportation supplies (account 4600) plus $12,979 in salaries for transportation personnel (account 2600). The yearly YRS incremental mileage is 40,140, which amounts to 4.1% of the district's total annual mileage. On a pro-rata basis, the additional bus operation expense would be $33,314 (4.1% of PVUSD's total transportation budget of $820,761).

Table 4-7 shows PVUSD's annual transportation costs for the years 1971-72 (the year before the introduction of YRS) through 1975-76. The number of pupils transported declined because of a change in transportation policy. (Before July 1972, children were generally eligible for transportation if they lived more than 3/4 mile from their school; this distance was changed to 1 mile.) Total bus operation expenses are expressed in constant dollars (using 1971 as the base). For 1975-76, the table shows an increase in operating costs of $89,833 over 1971-72 costs. Transportation costs directly attributable to YRS represent 20.9% of this amount.

The increase in transportation costs is a result of several district policy decisions. We believe that during the period of our study the district did not make a concerted effort to reduce the number of buses needed. (However, in 1976-77, rescheduling and rerouting reduced the number of buses needed to nine, resulting in lowered costs.)

As Table 4-7 shows, transportation costs did not increase immediately upon the introduction of the year-round program. This was due in part to the policy decision that made fewer students eligible for busing and in part to the policy of assigning all YRS students from the same neighborhood to a single track. When this policy was changed after the first year of YRS so that neighborhoods contained students from all four tracks, bus scheduling became much more complicated, bus routes generally became longer, and transportation costs increased. It was not until 1976-77 that the district was able to reduce the number of buses used by rerouting them to operate at an increased capacity. The resulting economies are, of course, not reflected in our estimate of YRS incremental transportation costs since they were not realized until the year after we collected cost data. However, it is important to recognize that well-planned routing of buses that serve year-round schools can reduce costs substantially.

Account 5000: Total Contracted Services ($47,643)--This account represents the total utilities bill for the five year-round schools. Of

Table 4-7

TRANSPORTATION EXPENSE

	1971-72	1972-73		1973-74		1974-75		1975-76	
	(1.00)*	(0.971)*	Δ_{1971}	(0.918)*	Δ_{1971}	(0.822)*	Δ_{1971}	(0.751)*	Δ_{1971}
Number of pupils transported daily one way	6,551	6,802	251	6,671	120	6,153	-398	6,264	-287
Cumulative total number days bus operation	10,666	11,228	562	11,034	368	10,856	190	10,791	125
Total miles traveled	885,970	908,934	22,964	1,019,593	133,623	1,085,071	199,101	988,939	102,969
Total bus operation expense adjusted to 1971 dollars	(526,559)†	(556,519)†		(721,030)†		(784,023)†		(820,761)†	
	526,559	540,380	13,821	661,906	135,347	644,467	117,908	616,392	89,833
Cost per pupil adjusted to 1971 dollars	(80.37)†	(81.82)†		(108.08)†		(127.42)†		(131.03)†	
	80.37	79.45	-0.92	99.22	18.85	104.74	24.37	98.40	18.03

*Cost of living adjustment to 1971 dollars.

†Before adjustment to 1971 dollars.

this total $27,904 was for electricity, $16,703 for gas, and $3,036 for water.

Incremental TCS Operating Costs

The total incremental operating cost associated with the year-round calendar is $228,721. This figure can be compared with our projections of the expenses that would have been incurred had PVUSD reverted to district-wide use of the traditional calendar in 1975-76, adding 5 classrooms at Rolling Hills and building an elementary school to provide another 11 classrooms. The estimated operating costs for the additional school and classrooms required under the TCS simulation are shown in Table 4-8 and in more detail in Table C-10 of Appendix C. These costs can be itemized as follows.

Table 4-8

PROJECTION OF INCREMENTAL OPERATING COSTS
UNDER THE TCS SIMULATION

Accounting Category		Additional School and Classroom Costs
1000	Certificated Salaries	$145,256
2000	Classified Salaries	18,093
3000	Employee Benefits	21,357
4000	Books, Supplies, and Equipment Replacement	--
5000	Contracted Services	57,408
6000	Sites, Building	--
7000	Other Outgo	--
	Total	$242,114

Account 1000: Total Certificated Salaries ($145,256)--This account covers salaries for certificated personnel who would be hired to staff the new elementary school and junior high classrooms.

- 1100--Teachers' Salaries--$124,040

  If PVUSD reverted to a traditional calendar, the number of teaching days required would remain constant. However, we assume that all teachers would work under standard (176-day) contracts. To provide the teaching days now covered by contract extensions and short contracts, the district would need to hire eight additional teachers. (The TCS simulation assumes that 16 new classrooms would be constructed. The other eight teaching positions would presumably be filled by teachers currently employed at year-round schools. Conversion of these schools to 9-month use would, in effect, reduce the number of classrooms and teaching positions available. Since salaries for these eight teachers are already covered by standard contracts, we do not include them as incremental costs, either under YRS or under the TCS simulation.)

  Salary costs for the eight additional teachers are calculated using the average teaching salaries at the five year-round schools.

- 1200--School Administration Salary--$21,216

  This amount covers the salary for a principal at the new elementary school. This cost is estimated using the starting salary for a principal in PVUSD (as of 1975-76).

Account 2000: Total Classified Salaries ($18,093)--The new elementary school would require a secretary and a custodian. We have not attempted to estimate how salaries for transportation personnel might be affected, since such effects would vary according to the location of the new school. (For example, if students who currently ride the bus were able to walk to the new school, the number of buses and drivers needed might be reduced.)

Account 3000: Total Employee Benefits ($21,357)--Associated with the new personnel required (principal, secretary, custodian, and eight teachers) are employee benefits of $21,357.

Account 4000: Books, Supplies, and Equipment Replacement ($0)--PVUSD budgets books and supplies on a per-student basis. Because enrollment remains constant under the TCS simulation, we have not provided for a cost increase in this account. We expect, however, that some additional expenses would be incurred in stocking a new school, such as library books and maintenance tools. If fewer students were eligible for transportation, costs for transportation supplies would be lower.

Account 5000: Contracted Services ($57,408)--Based on costs at a comparable school in the district, we estimate insurance premiums for the additional elementary school at $5,612.

The total incremental utilities cost is estimated at $51,796. There are three components of this cost: (1) utilities costs at the five year-round schools,* (2) utilities costs for the additional elementary school, and (3) costs for the five classrooms that would be added to Rolling Hills.

(1) Utilities costs for the five year-round schools are estimated at $43,169. The procedure used to derive this estimate was the following:†

   (a) We obtained the monthly electricity, gas, and water bills for the five schools.

   (b) Charges were totaled separately for two time periods--September through May and June through August.

   (c) We compared utilities costs from June through August at Amesti (a year-round school) with costs for the same period at MacQuiddy (a traditional school with approximately the same floor space and number of classrooms). For each utility, a ratio (summer costs at the traditional school to summer costs at the year-round school) was developed.

   (d) Actual utilities costs at the year-round schools during the summer were multiplied by these ratios to derive a simulated summer utilities cost.

   (e) The simulated summer cost was added to actual costs from September through May (which are assumed to be the same under both calendars) to derive the annual cost.

(2) The simulated annual utilities cost for Amesti ($4,505) was used as a proxy for utilities costs at the additional elementary school.

(3) The simulated annual utilities cost for Rolling Hills ($15,660) was divided by 19 to obtain a per-classroom annual cost of $824. This figure was multiplied by 5 to obtain a projection of $4,121 in utilities costs for the five new junior high classrooms.

---

*Recall that the YRS incremental utilities cost was calculated as the total utilities cost at the five schools.

†Data were not available to follow the procedures described in Chapter 4 of the Cost Analysis Handbook.

Operating Cost Comparison

The total annual operating cost for the additional school and classrooms required under the TCS simulation is estimated at $242,114. Comparing this figure with the total YRS incremental operating expense of $228,721 yields a net saving under the year-round schedule of $13,393, or about 6%. Although this saving is relatively small, we consider it significant given the fact that the district did not realize the potential for lowering transportation costs until the following year.

Transition Costs

Transition costs are the one-time costs incurred in putting a change into effect. They represent a special category of capital cost, and are distinguished from YRS incremental operating costs primarily by their nonrecurring nature. PVUSD's transition costs are displayed in Table 4-9. These figures were developed through review of district records and consultation with PVUSD personnel.

Included are costs for planning (e.g., the Study Commission's investigation of year-round alternatives, the campaign conducted to inform parents and community about YRS and assess their response prior to the Board's decision), in-service training for teachers, the district's evaluation efforts (which included student testing and surveys of parents' and teachers' opinions of the year-round schedule), and purchase of equipment and materials. Not included in the calculation of transition costs are contributed inputs, such as the time district administrators spent planning and implementing the schedule change.

The total cost of PVUSD's conversion to YRS was approximately $9,480. To estimate the annual cost to the district of the transition, this amount is amortized over a 20-year period at an interest rate of 6% (the same bond life and interest rate used earlier to reckon capital costs avoided

Table 4-9

TRANSITION COSTS

(1)	PLANNING		$4,176.67
	a. Research	$2,882.82	
	b. Consultant services	183.00	
	c. Policy development		
	d. Information systems development	260.73	
	e. Community relations	850.12	
(2)	IN-SERVICE TRAINING		757.60
	a. Substitutes	578.00	
	b. Consultant services	150.00	
	c. Problem-solving committee	29.60	
(3)	INSTRUCTIONAL/CURRICULUM MATERIALS AND SUPPLIES		-0-
(4)	EVALUATION		2,283.31
	a. Student forms	1,652.41	
	b. Surveys	630.90	
	c. Consultant surveys	-0-	
	d. Evaluation reports	-0-	
(5)	CAPITAL OUTLAY		2,262.11
	a. Air conditioning	-0-	
	b. Equipment	1,841.98	
	c. Attendance cards/materials	420.18	
		Total	$9,479.69

by the adoption of a year-round calendar).* This procedure (see Table 4-10) yields an annualized transition cost of $826, which can be combined with the capital and operating cost figures to determine the overall impact of the year-round program on PVUSD's annual budget.

Table 4-10

CALCULATION OF ANNUALIZED TRANSITION COSTS

(1)	TOTAL TRANSITION COSTS (from Form 12)	$ 9,479.69	
(2)	ANNUALIZED TRANSITION COST		
	a. Bond life (from Form 4A, Line 4a)	20	
	b. Bond interest rate	6%	
	c. Present value (from Form 4A, Line 4c)	11.47	
	d. Annualized cost (Line 1 ÷ Line 2c)		$ 826.48
(3)	TOTAL PAYOUT (Line 2a × Line 2d)	$ 16,524.54	
(4)	TOTAL INTEREST (Line 3 - Line 1)	$ 7,049.85	

Summary--The Overall Impact on PVUSD's Annual Budget

As shown in Table 4-11, the impact of PVUSD's year-round schools program on the district's annual budget was:

*For purposes of illustration we are assuming PVUSD borrowed money to meet this expense. This is what they would have done if the amount had been larger (because of a need to install air conditioning, for example). In PVUSD's case, a relatively small transition expenditure was incurred; therefore, instead of amortizing, we could either write off that amount in the 1975-76 budget or write it off over 20 years without including interest. (In actual fact, PVUSD was reimbursed by the state for this expense.)

- Capital costs: annual saving of $138,248
- Operating costs: annual saving of $13,393
- Transition costs: annual expense of $826.

Table 4-11

SUMMARY OF YRS/SIMULATED TCS COMPARISON

	YRS	TCS	
Operating Costs			
Certificated Salaries	129,648	145,256	
Classified Salaries	28,867	18,093	
Employee Benefits	10,521	21,357	
Books, Supplies, and Equipment Replacement	12,042	0	
Contracted Services	47,643	57,408	
Subtotal	228,721	242,114	
Net Difference			13,393
Avoided Capital Costs			138,248
Transition Costs			(826)
Total Saving (Expense) Due to YRS			150,815*

*If PVUSD had needed to purchase a school site for the elementary school, this would increase to $170,025.

These combine to produce a total annual saving of $150,815.† Slightly over 90% of this amount is represented by the avoided expense of constructing additional classrooms that would have been needed to house the district's enrollment adequately under the traditional calendar. As we noted previously, it appears that the conversion of five PVUSD schools to the year-round calendar relieved the bulk of overcrowding and thereby

†This annual saving would be approximately $170,025 if PVUSD had needed to purchase a school site.

realized the full potential for avoiding construction costs, given the current enrollment level and availability of facilities.

Whereas the capital cost saving was expected, the operating cost saving was somewhat of a surprise. The largest saving was in the area of teachers' salaries and benefits. Although the number of teaching days is the same under YRS and the TCS simulation, the district saved money by allowing teachers to work under nonstandard contracts. Three factors apparently contributed to this saving: (1) teachers with less than average salaries elected to extend their contracts; (2) teachers hired under contracts shorter than the standard 176 days tended to have below-average salaries; and (3) some benefits costs (e.g., retirement) do not increase when teachers' contracts are extended beyond the standard (at PVUSD benefits are 12.5% of all compensation expense). The combined effect of these factors was to lower the average teaching cost for days taught under nonstandard contracts.

The annual saving of $150,815 amounts to $56.53 per pupil (4.1% of the district's annual per-pupil expenditure).*

*Calculated by dividing the annual saving by the YRS population of 2,668 students. If land purchase had been needed, the saving would be $63.73 per pupil (4.6%).

5 MODEL SENSITIVITY ANALYSIS

In the previous chapters we described the theoretical framework that underlies the SRI cost model, the model itself, and the application of the model to the situation at the Pajaro Valley Unified School District. In this chapter we discuss the model's sensitivity to changes in various policy and background variables.

In the sensitivity analysis we make a series of small changes in the values of selected policy and background variables and observe what effect these changes would have on the conclusions. The sensitivity analysis allows us to:

(1) See which variables have the biggest effect on the outcome--that is, to ask which of the variables examined are the most important in determining whether YRS saves money.

(2) Enable school policymakers to see what effect selected policy changes would have on the cost differences between YRS and TCS.

(3) Find the enrollment level at which YRS becomes less costly than TCS.

(4) Show how sensitive our conclusions are to errors in the data--that is, if very large changes in the input variables are required to reverse the conclusion that YRS saves money, we can be very confident in our conclusions, since the levels of error in the values of the input variables are not likely to be that large.

From the 6 YRS cost areas discussed in Chapter 3, we identified 11 variables for use as inputs to the YRS sensitivity analysis. Nine of these are background variables:

(1) Population served by a school operating under a year-round schedule.

(2) Number of classrooms available at the school.

(3) Cost for construction* of an additional classroom.

---

*Where "construction" includes site acquisition and development, construction, furnishing, and financing.

(4) Annual utilities expense for the school (under both schedules).

(5) Annual utilities cost for an additional classroom.

(6) Annual teacher compensation (salaries and benefits) under both schedules.

(7) Annual nonteacher* compensation (under both schedules).

(8) Bus costs under both schedules.

(9) Transition costs.

Two policy variables are used as additional inputs to our sensitivity analysis. These are:

(1) Staffing ratio (average number of pupils per teacher).

(2) Number of classrooms assigned to purposes other than basic instruction.

Other policy variables of interest are subsumed within the background variables. For example, a policy permitting contract extensions is implied if the YRS and TCS teacher compensation costs differ.

Each variable listed above has a distinct value (or pair of values) in the current school situation. Using these starting values as inputs, we can calculate the per-pupil costs associated with the year-round and traditional alternatives. That is, we can determine the total dollar costs in a given fiscal year (operating costs plus annualized capital and transition costs), holding enrollment constant across the alternatives.

Obviously, per-pupil costs will vary if we change the values of policy or background variables. For example, assume that there are 20 classrooms at a school, but only 15 are used for basic instruction. If the staffing ratio is 30:1, and 600 students are served under a 45-15 year-round schedule, then the per-pupil cost of classrooms would be:

YRS: annual cost of plant ÷ 600

TCS: (annual cost of plant + amortized cost of constructing five new classrooms) ÷ 600 .

---

*"Nonteacher" refers to any school employee who does not teach (certificated or classified).

If all 20 classrooms are used for basic instruction, the classroom costs would be equal under both schedules (if the enrollment stayed the same).*

To determine the relative effect of changes in the input values, we conduct a sensitivity analysis, which proceeds as follows:

(1) The starting values are input for each variable.

(2) The unit costs are calculated for each alternative.

(3) Each policy or background variable is systematically varied to determine the magnitude of its influence on unit costs for the alternatives (i.e., by how much each variable has to change to change the result of the comparison).

(4) The variables are ordered with respect to their relative strength.

The computer program used for this analysis is shown in Appendix D. Below is a sample dialogue with the computer program, using arbitrary values for the variables. First, the variables' starting values are input:

```
♦♦♦♦♦ BACKGROUND VARIABLES ♦♦♦♦♦
STUDENT POPULATION..600
TOTAL CLASSROOMS..20
UTILITIES :: TCS, YRS ::1100,1200
UTILITIES COST PER CLASS..80
WAGES :: TCS,YRS ::150000,145000
NON-TEACHER WAGES :: TCS,YRS ::72500,77500
BUS COSTS :: TCS, YRS ::10000,9000
♦♦♦♦♦ POLICY VARIABLES ♦♦♦♦♦
STAFFING RATIO..30
CLASSROOMS NOT USED..5
```

Next, the variables used to compute classroom construction costs are entered:

```
SQ.FOOTAGE AVERAGE CLASSROOM..900
CLASSROOM COST PER SQ.FT...15
BOND LIFE..20
BOND RATE...05
```

---

*Although it can be argued that equivalent educational services are not being provided because five classrooms are available for other uses under YRS.

At this point we compute the savings* that result from the year-round schedule:

```
SAVINGS = $      7579.65
```

If the savings figure is zero or a negative number, then the YRS program does not save money, given the initial combination of background and policy variables.

The next step is to calculate the relative strength of each variable. The procedure is to adjust each variable up (or down) from its starting value by increments of 5% until it reaches a value of 5 times its starting value (or zero) or until the savings figure becomes negative (indicating that the year-round schedule has become more costly than the alternative). The output from this procedure is the final increment for the variable--the point at which a negative saving is realized under YRS--or the value 5, the largest value accepted. The sample output from this procedure is:

```
UNUSED = 1.70
CLASS% = 2.20
UTILIT = 2.00
UCLASS = 3.95
WAGE%  = 0.15
NWAGE% = 0.20
BUS %  = 3.00
TRANS% = 5.00
STAFFR = 0.70
SQFOOT = 2.20
% SQFT = 2.20
BOND % = 1.15
BOND L = 5.00
```

The ranking of these variables depends on the particular circumstances. In the example, teachers' wages is the most powerful variable; a 15% decrease in teachers' wages will make unit costs less under the

---

*These "savings" are the difference between TCS and YRS total costs, holding enrollment constant.

traditional calendar than under the year-round alternative. The order of variables in the example is:

(1)	Teacher compensation	15%
(2)	Nonteacher compensation	20%
(3)	Staffing ratio	70%
(4)	Bond interest rate	115%
(5)	Unused classrooms	170%
(6)	Utilities	200%
(7)	Bus expense	200%
(8)	Classroom cost	220%
(9)	Square feet per class	220%
(10)	Dollars per square foot	220%
(11)	Utilities cost per class	395%
(12)	Transition expense	No effect
(13)	Amortization period	No effect.

The sensitivity analysis for PVUSD produced relative potencies of each input variable for the district as a whole and for each of the five year-round schools, as shown in Table 5-1. Inspection of this table shows both similarities and differences across schools. Staffing ratio--a factor over which policymakers can exert some control--is consistently the most powerful variable. At two schools, a staffing ratio increase as small as 10% could make the traditional-calendar alternative less expensive than the current year-round program. Across all schools, staffing ratio would have to increase by 25% to result in a saving under TCS. Given current enrollment levels, other relatively potent policy variables are teacher compensation, number of classrooms used for other purposes, and nonteacher compensation, although the potency of each of these variables differs widely across schools. The remaining input variables either cannot be controlled by policymakers (bond interest rate, classroom construction and utilities costs) or have little impact.

The differences among the schools reflect background and policy variable dissimilarities. For example, Calabasas had no extended contracts (teacher compensation); Freedom had 8 teachers work extended

Table 5-1

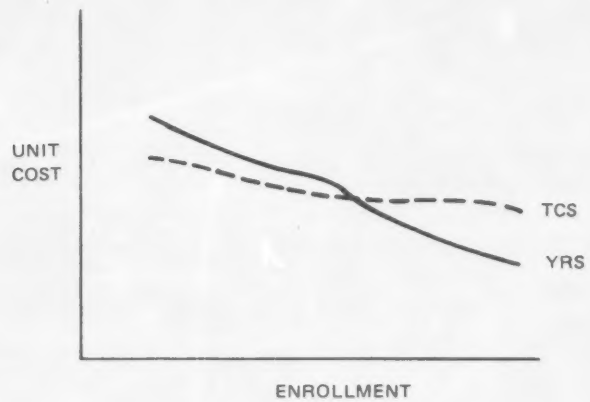
RELATIVE POTENCY OF INPUT VARIABLES GIVEN CURRENT ENROLLMENTS

Input Variable	Percent Change Required To Make Unit Costs Less Under TCS					
	District	Amesti	Calabasas	Freedom	Hyde	Rolling Hills
Staffing ratio	25%	65%	30%	10%	10%	25%
Teacher compensation	110	70	No effect	45	No effect	300
Bond interest rate	110	110	95	95	95	95
Classroom cost	120	150	95	100	45	100
Square feet per class	120	150	95	100	45	100
Dollars per square foot	120	150	95	100	45	100
Utilities cost	270	No effect	385	145	140	310
Nonteacher compensation	330	No effect	310	160	75	No effect
Unused classrooms	370	375	No effect	80	No effect	450
Utilities cost per class	No effect at any school					
Bus expense	No effect at any school					
Transition cost	No effect at any school					
Amortization period	No effect at any school					

contracts. While Calabasas used all its classrooms for basic instruction, Amesti reserved 2 of its 16 for a library/learning center. The combination of these and other variables determines not only the differences in "potency" of variables among schools, but also the changes in ranking. For example, while Calabasas housed 450 students in only 12 classrooms, Hyde housed 440 students in 13 classrooms. Because Calabasas used its classrooms more efficiently, it would take a large change in any variable to eliminate the YRS savings (e.g., staffing ratio would have to change from 29:1 to 37:1). On the other hand, the situation at Hyde would change more rapidly because its classrooms are used somewhat less efficiently.

Another use of the sensitivity analysis is to ask at what enrollment level the per-pupil cost for year-round schedule first becomes less than or equal to the per-pupil cost under a traditional schedule (holding constant all other variables)? For the district policymaker this answers the question: What is the lowest enrollment level at which YRS saves money?

If we let the Y-axis represent unit cost per student per year and the X-axis be enrollment, we would expect an effect like the following:



The SRI cost model carries out the analysis in the following manner:

(1) The starting values are input.

(2) Enrollment is varied until unit costs for TCS and YRS are equal (or the relationship sign changes). The point at which

this happens is called the "break" point (or equilibrium point).

(3) Each policy and background variable is varied by increments of 5% to determine the magnitude of its effect at the minimum enrollment level. This process identifies the most powerful variables at the break or equilibrium point.

Below is an example (using arbitrary numbers) of how this process operates:

```
◆◆◆◆◆ BACKGROUND VARIABLES ◆◆◆◆◆
STUDENT POPULATION..600
TOTAL CLASSROOMS..20
UTILITIES :: TCS, YRS ::12000,13000
UTILITIES COST PER CLASS..1000
WAGES :: TCS,YRS ::165000,150000
NON-TEACHER WAGES :: TCS,YRS ::120000,130000
BUS COSTS :: TCS, YRS ::12000,11000
TRANSITION COSTS..20000
◆◆◆◆◆ POLICY VARIABLES ◆◆◆◆◆
STAFFING RATIO..30
CLASSROOMS NOT USED..5
STANDARD CONTRACT LENGTH..176
TOTAL DAYS SCHOOL IN USE..222
CONTRACT EXTENSIONS? (YES=1)..1
◆◆◆◆◆ CLASSROOM CONSTRUCTION VARIABLES ◆◆◆◆◆
SQ.FOOTAGE AVERAGE CLASSROOM..900
CLASSROOM COST PER SQ.FT...25
BOND LIFE..20
BOND RATE (INTEGER %) =5
```

Variable input

```
SAVINGS =$    23437.60
```

Savings at 600

```
UNUSED = 1.70
CLASS$ = 2.20
UTILIT = 2.00
UCLASS = 3.95
WAGES  = 0.15
NWAGES = 0.20
BUS $  = 2.00
TRANS$ = 5.00
STAFFR = 0.70
SQFOOT = 2.20
$ SQFT = 2.20
BOND % = 1.15
BOND L = 5.00
```

Sensitivity analysis at 600

```
BREAK POINT =  390
SAVINGS =$    2194.61
```

Break point savings at 390

```
UNUSED = 0.15
CLASS$ = 5.00
UTILIT = 0.20
UCLASS = 5.00
WAGES  = 0.05
NWAGES = 0.05
BUS $  = 0.20
TRANS$ = 5.00
STAFFR = 0.05
SQFOOT = 5.00
$ SQFT = 5.00
BOND % = 5.00
BOND L = 5.00
DO YOU WANT TO REPEAT THE ANALYSIS? (YES=1)..0
```

Sensitivity analysis at 390

The example demonstrates that the relative strength of some variables changes at different enrollment levels. In this case, staffing ratio is much more powerful at the break point than at the current actual enrollment. This illustrates that at lower enrollment levels the classrooms are not used as efficiently, so that the savings can be eliminated by smaller variable changes.

A second example, using starting values from a PVUSD year-round school (Amesti), further illustrates the usefulness of this technique.

```
***** BACKGROUND VARIABLES *****
STUDENT POPULATION..600
TOTAL CLASSROOMS..20
UTILITIES :: TCC, YRS ::12000,13000
UTILITIES COST PER CLASS..1000
WAGES :: TCC,YRS ::150000,150000
NON-TEACHER WAGES :: TCC,YRS ::120000,130000
BUS COSTS :: TCC, YRS ::12000,11000
TRANSITION COSTS..20000
***** POLICY VARIABLES *****
STAFFING RATIO..20
CLASSROOMS NOT USED..5
STANDARD CONTRACT LENGTH..176
TOTAL DAYS SCHOOL IN USE..222
CONTRACT EXTENSION? (YES=1)..1
***** CLASSROOM CONSTRUCTION VARIABLES *****
SQ.FOOTAGE AVERAGE CLASSROOM..900
CLASSROOM COST PER SQ.FT...25
BOND LIFE..20
BOND RATE (INTEGER %) =5

SAVINGS =$   23437.50
```

Given its current enrollment of 550, Amesti is realizing a saving of approximately $57,000, slightly more than $100 per student. At the current enrollment level, the critical cost components are:

(1) Staffing ratio

(2) Teacher compensation

(3) Bond interest rate

(4) Classroom construction cost (classroom size and cost per square foot)

(5) Number of unused classrooms.

The saving of $56,864 realized at this enrollment level results from three factors:

(1) Classroom construction--At an enrollment of 550, five additional classrooms would be needed under TCS. The annual construction cost avoided under YRS is $38,464.

(2) Teacher compensation--Because of extended contracts, Amesti saves $24,455 in teacher compensation.

(3) From these two areas of savings it is necessary to subtract the incremental expenses of

- Nonteacher compensation $1,434
- Transportation 5,409
- Transition cost (amortized) 165.

The enrollment analysis indicates that the break point for Amesti is at 261 students, less than half the current actual enrollment. A sensitivity analysis conducted at this enrollment identifies teacher and nonteacher compensation and utilities costs as the critical variables.

Current enrollments and break points for all five year-round schools are compared in Table 5-2. As this table shows, the reduction in enrollment required to make TCS less expensive than YRS varies dramatically from school to school. At two schools, a relatively small decline in the student population would cancel out the savings currently realized under YRS. At the other schools, enrollment would have to decline substantially before TCS would become more economical than YRS.

The same procedure can be used to vary other background and policy variables. As one would expect, if we reduce the classroom floor space

Table 5-2

COMPARISON OF CURRENT AND BREAK-POINT ENROLLMENTS

	Amesti	Calabasas	Freedom	Hyde	Rolling Hills
Current enrollment	550	450	650	440	590
YRS capacity	575	464	800	498	624
TCS capacity	432	348	603	374	468
Break-point enrollment	261	377	609	435	494
Percent change required to reach break point	53%	16%	6%	1%	16%

(number of square feet), the saving realized by YRS decreases (primarily because construction of new classrooms is less costly if the rooms are smaller). For example, if the average size of a classroom at Amesti were 900 rather than 1,595 square feet, the analysis would show the following:

```
DO YOU WANT TO REPEAT THE ANALYSIS? (YES=1)..1
♦♦♦♦♦ BACKGROUND VARIABLES ♦♦♦♦♦
STUDENT POPULATION..550
TOTAL CLASSROOMS..16
UTILITIES :: TCS, YRS ::12000,13000
UTILITIES COST PER CLASS..1000
WAGES :: TCS,YRS ::87376,62921
NON-TEACHER WAGES :: TCS,YRS ::9352,10786
BUS COSTS :: TCS, YRS ::0,5409
TRANSITION COSTS..1896
♦♦♦♦♦ POLICY VARIABLES ♦♦♦♦♦
STAFFING RATIO..29
CLASSROOMS NOT USED..2
♦♦♦♦♦ CLASSROOM CONSTRUCTION VARIABLES ♦♦♦♦♦
SQ.FOOTAGE AVERAGE CLASSROOM..900
CLASSROOM COST PER SQ.FT...55.32
BOND LIFE..20
BOND RATE (INTEGER %) =6

SAVINGS =$    39150.42
```

The change in classroom floor space has decreased the overall saving by about one-third. It has also led to some changes in the list of critical variables, which are now:

(1) Teacher compensation

(2) Staffing ratio (now less powerful than teacher compensation)

(3) Bond interest rate

(4) Classroom construction costs

(5) Nonteacher compensation (which was not a critical variable in the original analysis)

(6) Unused classrooms.

This indicates that a greater proportion of the YRS saving is now due to teacher compensation (because of extended contracts).

Next we examine the impacts of changing district policy so that teachers at this school could not extend their contracts. If we thus assume that teacher compensation is the same under YRS and TCS and hold all other variables constant at their starting values, the result is a reduction in the saving to $31,456 (a reduction of more than 40%). Under these circumstances, the most critical cost components are:

(1) Staffing ratio

(2) Classroom construction cost

(3) Bond interest rate

(4) Unused classrooms

(5) Nonteacher compensation.

Here most of the YRS saving is due to avoided classroom construction.

In Appendix E, we present a sensitivity analysis for each year-round school in PVUSD, indicating the relative strength of each background and policy variable at both the current and break-point enrollment levels. We also present an analysis for the entire district.

We believe that this sensitivity analysis:

(1) Shows which variables have the biggest effect on the outcome--staffing ratio is consistently the most powerful; teacher compensation is also significant (where contract extensions are permitted).

(2) Enables school policymakers to see what effect selected policy changes would have on the cost differences between YRS and TCS--at Amesti school changes in classroom floor space or teacher compensation would have a significant effect on the YRS saving.

(3) Determines the enrollment level at which TCS becomes more expensive than YRS--at Amesti YRS realizes a saving at an enrollment of 261 (compared with a current enrollment of 550 or a traditional-calendar capacity of 432).

(4) Shows how sensitive our conclusions are to errors in the data--since relatively large changes in the variables would have to occur before we would reverse our conclusion that YRS saves money, we are very confident in our conclusions.

6 SOME ISSUES RELATED TO THE COSTS OF YEAR-ROUND SCHOOLS

In this chapter we answer some general questions that have been raised concerning the costs of the year-round schedule.

Hidden Cost Factors

The SRI cost model focuses on particular background and policy variables. Are there important cost factors that have been overlooked by the model?

We used two approaches to provide for completeness in the cost model. First, we compared our ordering of the importance of background variables with the ranking of these variables in terms of their impact on the typical school budget. Data in "National Comparison Local School Costs" (Market Data Retrieval, 1977) indicate that in 1975-76 the typical LEA budget contained the following cost components:

Classroom teachers	46.14%
Nonteacher personnel	19.95
Employee benefits	6.25
Debt service	5.75
Current capital outlay	3.26
Utilities	3.18
Transportation	3.18
Subtotal	87.71%
Miscellaneous (various costs, none larger than 2%)	12.29
Total	100.00%

The largest category by far is personnel, with 72.34% of the total budget. The other major expenses are associated with capital costs (9.01%), utilities (3.18%), and transportation (3.18%). These categories are the same

as our background cost variables. From this perspective we conclude that we are using the most important cost components in our model.

Second, we have used the cost analysis model in several districts and discussed the input variables and outcomes with various LEA staff members. There has been general agreement that we are emphasizing the correct variables.

Impact of Policy Variables

The SRI cost model emphasizes three policy variables: staffing ratio, contract extensions, and classrooms used for purposes other than basic instruction. How do changes in these policy variables affect the educational program?

Staffing Ratio (Class Size)

The Coleman report Equality of Educational Opportunity reports that staffing ratio appears to have "a consistent lack of relation to achievement among all groups under all conditions" (Coleman et al., 1966, p. 312). Some recent studies have reported slight effects; a Philadelphia study concluded that "classes over 34 are detrimental in grade schools, low achievers gain in classes of less than 28" (New York Times, Education Supplement, p. 1). However, Levin concludes that "There is not even evidence to support the contention that reducing class size will improve [reading score] outcomes" (Levin and Carnoy, 1976).

The effect of lowering the staffing ratio is a subject of debate in the education literature. There appears to be a majority view, however, that a change in staffing ratio can result in changes in teaching practices, classroom processes, and student outcomes. A drastic increase or decrease in class size is particularly likely to produce a change in the behavior of teachers and students.

At two PVUSD schools, a 10% change in staffing ratio (i.e., an increase from 29:1 to 32:1) would make the TCS alternative less expensive than YRS. Evidence from the literature suggests that a change of this

magnitude would probably not result in a significant change in the nature of the educational program provided. At the other PVUSD schools, however, much larger increases would be needed--between 25% and 65%--before TCS would be more economical. Such large increases in class size are probably not feasible, given state guidelines, teachers' associations, and other factors. However, increases of 25% or more, if implemented, would probably result in significant changes in the nature of the educational program.

Teacher Contract Extensions

At Amesti, Freedom, and Rolling Hills a considerable number of YRS teachers have elected to extend their contracts. The effect of these extensions is to decrease the total compensation paid for the days in question.

At Amesti there are 3,520 teaching days. Under a traditional schedule, these days would be covered under 20 standard contracts at 176 days each. Under the year-round schedule there are 27 contracts:

Contract Length	Number of Teachers	
224	2	
201	1	4
191	1	
176	11	
146	1	
137	1	
118	1	
113	1	
62	1	
58	1	12
30	2	
20	1	
15	1	
10	1	
5	1	
	27	

Of the 27 contracts, 11 are for the standard 176 days, 4 include extensions of up to 48 days, and 12 cover periods shorter than the standard. The average daily salary paid for the 880 days covered by extensions and

short contracts is $63.27. The average daily salary paid for teachers who worked a standard 176-day contract is $88.73. If we assume $88.73 as the average daily salary of the additional teachers who would work a standard contract under TCS, Amesti saved $25.46 per day for the 880 days covered by extensions and short contracts, for a total saving of $22,405.

Does the use of less expensive personnel for the 880 days (25% of Amesti's total teaching days) reflect a deterioration in the educational program? School officials believe that the program they are providing is at least equivalent to the TCS program and perhaps superior (some of the short contracts--5 to 20 days--are used to employ teachers who can present brief "enrichment" courses like film-making). On the other hand, the New York Times recently summarized findings regarding teacher salaries (New York Times, 1977). The article noted that, whereas the Coleman report sees no relationship between teacher salaries and student achievement, a 1972 State University of New York study "notes a positive relationship between median salaries and average student achievement."

It might be argued that the use of contract extensions can have the effect of changing the educational program at a school. However, according to the companion study to this volume (Volume I, Final Report), there appear to be no differences in achievement levels between YRS and TCS students. This finding holds true regardless of the average salaries of the teachers.

Classroom Use for Purposes Other than Basic Instruction

When a school converts to a 45-15 schedule, it "gains" one-third more classrooms. A TCS with 12 classrooms serving 360 children can house 480 children under YRS. However, the school may elect not to serve this potential enrollment. For example, if it chooses to serve 360 children, only 9 classrooms are required for basic instruction, and the other 3 classrooms are available for other uses. This represents an opportunity cost. Whether one views the alternative use of these classrooms as a net benefit or as an expense depends on the use made of the rooms. Below, we discuss uses observed at PVUSD and possible cost consequences:

(1) Use of classrooms for intersession--At Freedom Elementary School two classrooms are used for intersession that would be used for regular instruction under a traditional calendar. If Freedom were a TCS, its classrooms would be unoccupied during the summer, except for a few rooms used for summer school. The use of classrooms for intersession provides the YRS equivalent of summer school. Is intersession more productive than summer school? The results of the main study are ambiguous.

(2) Use of classrooms for a library/learning center--At Amesti Elementary School three classrooms are combined to provide a library/learning center. (The principal said that before the change to the year-round calendar they had been used as a classroom, a library, and a storage room.) One room is still counted as a classroom because the combined use of the three rooms is overseen by a teacher who is also a certificated librarian. (This teacher is assigned 29 children who are actually distributed among the other 12 classes--usually there are more than 29 children in the library/learning center.) The center currently serves several purposes:

- It houses a large library.
- Considerable space is devoted to special learning/reading equipment (purchased with ESEA Title II and National Defense Education funds).
- Sections of the library are reserved for use by the bilingual and special education programs.

What is the utility of using the classrooms in this manner as opposed to returning them to their traditional use? There is no clear answer to this question. If there were no library/learning center, these resources would not be equally available to all children; therefore, the current distribution has broader utility. If the space were no longer available for providing bilingual and special education services on a "pull-out" basis, these programs would have to be conducted in the regular classrooms. There has been a continuing debate about the merits of "pull-out" versus "in-class" programs; there is no general agreement that "pull-out" programs are more beneficial than "in-class" services.

(3) Use of classrooms for a reading resource center--At Freedom Elementary School two classrooms are used as a reading resource center, funded by state (Educationally Disadvantaged Youth and Miller-Unruh Basic Reading Acts) and federal (ESEA, Title I) grants. Because almost all Freedom students qualify for these services, entire classes rotate into the reading center, along with the classroom teacher and aides. (Those few children who do not qualify for services receive individual instruction from their teacher.) Because the entire class goes to the reading resource center, the Freedom program is not a "pull-out" program, and its utility should not be discussed in "pull-out"

versus "in-class" terms. Rather, one should ask if there are other reasonable alternatives for the delivery of these services. One obvious alternative would be for the reading specialists to put their materials on portable carts and to move their program from class to class. Another alternative would be to move the reading specialists and their equipment into the school library* (which is in use only 2 hours per day).

Summary

In summary, these three policy variables probably do have an impact on program cost and quality:

(1) Staffing ratio--Even small changes can have an effect on program cost. However, slight changes probably do not change the educational program (holding everything else constant).

(2) Teacher contract extensions--Contract extensions and short contracts can be used to lower the cost of the average daily teacher compensation. This does not appear to affect the quality of the services provided.

(3) Use of classrooms for purposes other than basic instruction--The elimination of a classroom from the pool of available classrooms has clear cost consequences. It is not evident that the benefits arising from alternative uses of classroom space outweigh the expense of making the rooms unavailable for basic instruction.

Depreciation Schedules

LEA policymakers often inquire whether the year-round schedule, which uses buildings and equipment more intensively, inevitably leads to a more rapid depreciation of these assets. This subject is discussed in the literature in only a very general fashion. However, the Northville, Michigan, YRS feasibility study contains a letter from the LEA transportation vendor:

> ... it has been proven in many instances that vehicle deterioration is not greater, or even less so, when the units are being utilized as it is when the vehicles set idle for sustained periods such as summer vacation ... [sic]. (Person-O-Metrics, 1973)

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*The library is not counted as a classroom because it was designed specifically as a library.

In discussions with the PVUSD business manager and his staff, we inquired about depreciation of fixed assets due to increased usage under YRS. Some staff expressed the opinion that depreciation schedules would be accelerated over time. The only specifics they provided regarded "deep cleaning." As noted in Chapter 3, the maintenance supervisor reported that under a traditional schedule the cleaning of light fixtures, upper walls, and relatively inaccessible classroom areas is accomplished during the summer. Since YRS does not include an extended period during which students are off campus, the intensive cleaning is spread over the year. However, the intensive cleaning is not accomplished as thoroughly as at traditional schools. The maintenance supervisor believes that if the entire district were to convert to YRS, he would need a two- or three-man crew to go from school to school and perform this "deep cleaning."

It is unlikely that the buildings and equipment would deteriorate faster if this cleaning were not performed. If, however, conditions were allowed to deteriorate substantially, health and safety hazards might develop, and staff morale, student achievement, and other factors might be adversely affected.

Student Attendance

One of the claims made for the year-round schedule is that it lowers the student absence rate because students have more frequent vacations. If this is true, we might expect lowered absence rates to have positive educational and cost consequences. Average daily attendance (ADA), which is used as the basis for state reimbursement, is the sum of actual student attendance plus excused absences for each day that school is in session. If YRS increases actual attendance and/or reduces unexcused absences, then it would have a salutary effect on the school reimbursement level.

We found no significant differences between pupil absence rates at the year-round and traditional schools included in this study:

	Average Days Absent per Student	
	Excused	Unexcused
TCS	8.2	3.2
YRS	9.4	3.4

Vandalism

Proponents of year-round schools believe that the year-round program will reduce school vandalism because the buildings are occupied during the summer (and therefore vandals have less opportunity to damage the schools). Another claim is that because YRS pupils do not have an extended summer vacation, they are less likely to become bored or restless and tempted to perform malicious acts.

According to PVUSD staff, vandalism has never been a serious problem in the district, so that there has been little opportunity for YRS to produce a positive impact in this area. The incidence of vandalism has continued to be quite low since the introduction of YRS. Local law enforcement officials echoed these sentiments.

Opportunity Costs

Henry Levin defines opportunity costs as resource costs "determined by their worth in the most productive alternative environment" (Levin, 1975, p. 100). Several important opportunity costs are relevant to PVUSD's year-round program:

(1) Transition time. During the transition to the year-round schedule, many school officials spent time (at both their own and the district's expense) planning for the change. This "contributed" time was not treated as a transition expense. However, since other uses could have been made of this time, the time spent in planning may represent a significant hidden cost factor.

(2) Principals' time. The standard contract for a principal in PVUSD is 206 days (including 30 days when school is not in session). Under the year-round schedule, principals work a 226-day contract, and school is in session for all 226 days. We assume that a principal's time is used differently when school is closed. As such, the change in the use of principals' time may be an important consideration.

(3) Land. PVUSD has several sites available for construction of new schools (a sunk cost). As noted in Chapter 4, the availability of land has the effect of lowering the cost of building additional schools and therefore reducing the saving realized through YRS. If the entire district converted to YRS, conceivably these sites could be sold.

These are a few of the opportunity cost factors that might have a bearing on the cost analysis. The most prominent opportunity cost, of course, is the expanded use of facilities and equipment under the year-round schedule: there are clear benefits in the use of buildings and buses all year.

7 CONCLUSIONS

In the preceding chapters we have presented the YRS cost model and used it to determine per-pupil costs in PVUSD under YRS and TCS. The model was also used to evaluate the sensitivity of costs to changes in various policy and planning variables. It is useful at this point to review the assumptions underlying the model:

(1) The best way to analyze the cost impact of a schedule change at a school is to compare the actual operation under one schedule with what it would have cost to operate the same school (and program) under the alternative schedule (i.e., with a simulation). Our study and others have shown that the change to a year-round schedule activates a variety of other innovations not directly related to schedule. At PVUSD, for example, special reading services were provided through "pull-out" programs as classrooms became available. Because these changes are not inherent in the schedule change, it is inappropriate to attribute their budgetary impact to YRS. The simulation approach seems to us to be the only acceptable way of evaluating the budgetary impacts of the year-round program.

(2) The unit of analysis is the school. This assumption is particularly important in the case of PVUSD because: (a) not all the district's schools were on a year-round schedule (so that cost savings were not as clear at the district level as they were at the school level), and (b) the sensitivity analysis reveals that the key planning and policy variables tend to differ from school to school.

(3) The comparison of YRS to TCS operating costs at a school must proceed on the basis that the same number of students are receiving the same basic instructional services under both alternatives. This was an important assumption in the analysis for several reasons:

   (a) Changes in enrollment are accompanied by a variety of nonlinear incremental cost changes, such as additions to the school administrative staff. By holding enrollment constant under YRS and TCS, such changes are avoided.

   (b) Holding enrollment constant permits easy conversion of total program costs to unit costs (total costs divided by enrollment). Unit costs under the two calendars can be compared directly to derive the annual YRS saving (or cost) per child. A saving of 4%-5% was realized at PVUSD.

(c) This approach also facilitates calculation of the break point in the sensitivity analysis (the enrollment level at which TCS costs first exceed YRS costs).

(4) The model must make clear the consequences of policy changes. The sensitivity analysis reveals that certain variables, such as staffing ratio, have a much more powerful effect than others on the savings (or costs) resulting from YRS. This information is useful in understanding which decisions are key ones in realizing the savings made possible by the change to a year-round schedule.

(5) The basic instructional program, used as the basis for comparison, is the program of classroom instruction mandated for all students for the term prescribed by law. This assumption (actually a corollary of assumption 3) has practical significance because the data for categorical programs are much more difficult to collect than are data on basic instruction.

The model was constructed in accordance with these assumptions. The analysis conducted at PVUSD revealed a net saving due to the year-round schedule.

We made use of the model to answer the set of questions detailed in the RFP:

- How do the operating costs of a year-round school compare with those of the same school operating on a traditional 9-month schedule? Our analysis indicates that it is quite possible to reduce operating costs under YRS.
- If YRS teachers are given the option to extend their contracts, how does this affect operating costs? At PVUSD this resulted in operating savings.
- If nonteacher YRS personnel are given the option of extending their work contracts, how does this affect operating costs? At PVUSD this was an incremental expense.
- If personnel work longer contract periods, how does this affect employee benefits? At PVUSD the benefits had ceilings, so that extended contracts resulted in some relative reduction of benefits.
- What is the response of staffing ratios to the implementation of YRS? At PVUSD no change resulted from YRS. However, an increase in staffing ratios would reduce YRS savings.
- How do transportation costs respond to YRS? At PVUSD they went up initially but recently have been reduced. However, potential transportation savings under YRS are difficult for policymakers to understand.

- How are depreciation schedules affected by YRS? If a school is in use for more days during the year, is its depreciation schedule accelerated? We found no evidence of accelerated depreciation schedules at PVUSD.
- What is the effect of YRS on the allocation of overhead costs? At the school level, overhead costs are spaced over a larger population base.
- What site-specific cost factors are critical to the determination of operating costs? The use of classrooms for purposes other than basic instruction and the use of teacher contract extensions are two critical factors.
- Where YRS has been implemented primarily for reasons of cost, how do the anticipated savings compare with the actual savings? Usually they are less because program changes are introduced at the same time as the schedule change. The YRS model makes explicit the expected savings and their sensitivity to various program changes.

From a broader perspective, there are three primary study findings:

(1) The most appropriate method for YRS cost analysis is to compare actual costs incurred under YRS with a simulation of costs for providing the same educational program to the same student population during the same time period under TCS. The design of the SRI cost model avoids the problems implicit in the methodologies of previous YRS studies.

(2) Properly implemented, a YRS program saves money.

- The annual saving to PVUSD was $150,815 for 1975-76. This amounts to $56.53 per pupil served, or 4.1% of the district's annual per-pupil expenditure.
- Construction and financing costs "avoided" by year-round use of existing facilities amounted to an annual saving of $138,248--more than 90% of the total saving. The total saving would have been $170,025 ($63.73 per pupil served) if PVUSD had not had land available on which to build an additional elementary school.
- Annual operating costs were $13,393 lower under YRS, mainly because of savings in teacher costs, insurance, and utilities. This is somewhat surprising, since most feasibility studies (including the one conducted at PVUSD) project a slight increase in operating costs.
- PVUSD could have saved more money at the five year-round schools by reducing the number of school buses used and utilizing all available classroom space for basic instruction.

- Further, there are obvious opportunity costs involved in a change to a year-round schedule that make the PVUSD situation even more profitable. Among these are year-round use of support facilities such as the transportation yard (versus relative idleness in the summer) and a more concentrated use of principals' time.

(3) Policy changes can substantially affect YRS savings.

- Staffing ratio, use of nonstandard teaching contracts, and number of classrooms used for purposes other than basic instruction were found to be potent policy variables. If policymakers change these variables, the YRS savings realized can change dramatically.
- Savings under YRS are reduced substantially when schools operate at less than full capacity. If all five PVUSD year-round schools served the maximum enrollment possible under YRS the savings in annual capital costs would increase by about $86,000. Savings in operating costs would also increase.

A recent estimate was that 3.6% of all elementary schools in the United States are on double sessions. This deficit could be immediately remedied if the affected schools converted to a year-round calendar. From our experience at PVUSD, we expect that such a change would realize a saving of $100-$120 million.* Given the fact that YRS and TCS programs are educationally equivalent, we believe that policymakers at all levels should seriously consider the YRS savings potential.

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*Based on total cost of education in U.S. public schools of approximately $71.6 billion (Market Data Retrieval, 1977), times 3.6% of population times per-pupil saving of 4.6% (PVUSD figures including land).

Appendix A

YEAR-ROUND SCHOOL COST LITERATURE

There are two types of literature pertaining to costs resulting from a shift to a year-round schedule. The first consists of material which discusses cost analysis of a year-round schedule in general. The second type documents actual YRS cost studies.

General Evaluation Literature

Chapter III of Year-Round Education: Economic, Educational and Sociological Factors by John D. McLain (1973) concerns the evaluation of the costs of a year-round schedule. McLain clearly and succinctly distinguishes between capital outlay, operational costs, and transition cost. He forecasts the following operating cost effects (p. 52):

	Range of Change (percent)	Impact on Elementary Budget (dollars per pupil)
Administration		
Professional salaries	0	0
Clerks and secretaries	0	0
Other expenditures	0	0
Instruction		
Classroom teachers	0	0
Other professionals	+10 to +20	+6.00 to +12.00
Clerks and secretaries	+10 to +20	+1.54 to +3.08
Textbooks	-25 to 0	-1.73 to .00
Other teaching materials	-15 to -10	-2.79 to -1.86
Other expenditures	0	0
Health		
Professional salaries	0 to +33-1/3	0 to +1.17
Other expenditures	+15 to +25	+.10 to +.18
Operation		
Custodial salaries	0 to +25	0 to +7.92
Heat	0	0
Utilities other than heat	0 to +25	0 to +3.04
Other expenditures	0	0

	Range of Change (percent)	Impact on Elementary Budget (dollars per pupil)
Maintenance		
Maintenance salaries	0 to +25	0 to +1.95
Other expenditures	+10 to +20	+1.21 to +2.42
Transportation		
Salaries	0 to +5	0 to +1.59
Other expenditures	0	0
Fixed charges		
Retirement fund	-15 to -10	-5.88 to -3.92
Other expenditures	-15 to -10	-2.28 to -1.52
Other services	0	0
Total		-3.83 to +26.05

McLain concludes this chapter on a cautious note:

> School systems not confronted with the need to expand their building facilities, however, should not initiate an all-year school program with the expectation of attaining a major savings or increase in efficiency of the operational budget. (p. 55)

McLain's book is a useful introduction to the concepts that underlie a YRS cost analysis. Unfortunately, these concepts are not illustrated by examples from actual YRS experience.

A similar book is Administrator's Guide to the Year-Round School by George Isaiah Thomas (1973). Chapter 3, "Realizing Economy Objectives Through Releasing Classroom Space" begins on an ominous note: "Historically there is little evidence that school systems have saved classroom space or dollars through rescheduling the school year." Thomas explains why this was the case (most extended-year programs have not been mandatory) and describes how to calculate the theoretical savings. We also found Chapter 6, "Cost Reduction Possibilities in Current Expense Categories," and Chapter 7, "Projecting Potential Savings in School Bus Transportation," useful.

Thomas' book is more technical than McLain's; and there are many more examples, some from actual year-round experience. This book would be particularly useful for a school district official charged with the

responsibility of preparing an economic feasibility study of a planned conversion to YRS.

The California State Department of Education has published the Year-Round Education Handbook (1975). Although geared to California circumstances, this 57-page document is noteworthy for several reasons. It contains a "Feasibility study checklist," which considers economic and other criteria (pp. 35-38). The handbook also details the planning (transition) costs considered for reimbursement by the state. (For example, California law permits reimbursement up to $25,000 plus additional assistance for air conditioning.) Finally, the handbook has an excellent pre-1975 bibliography.

Numerous doctoral dissertations have been written on the subject of YRS. Recently the National Council on Year-Round Education published a listing of doctoral dissertations, masters theses, and unpublished material (1977). The best dissertation we have unearthed is that of Robert Jewell Lloyd, "A Year-Round School Schedule: The Financial Implications in California" (1973). Lloyd did a study of California YRS programs in 1972-73. From this analysis he produced a list of findings, four of which are particularly relevant to this study:

> Essential to meaningful cost comparison is the assurance that like things are being compared. Thus, analysis should be made under the following conditions:
>
> (a) Long run cost effects are used for comparison--not "start-up" or transition cost experiences.
>
> (b) Quantity of education is the same--that is, students receive the same number of hours and days of instruction under both programs.
>
> (c) Quality of education is the same--the supply and equipment level, amount of support services, teacher-pupil ratio, etc. does not change.
>
> (d) Statutes and general policy the same--particularly as they relate to items such as attendance requirement and transportation. (pp. 117-118)
>
> The largest single potential for economy is in better utilization of facilities so as to avoid costs of construction, additional equipment and debt service. (p. 121)

Indications are that the overall operating expenses on a 45-15 staggered year-round schedule are no more costly than on a traditional schedule. (p. 121)

While all school districts should be interested because of the potential for economies, those districts which should be most interested can be characterized as follows:

(a) Those districts at the maximum or near maximum of bonding capacity and whose enrollment projections indicate a need for additional facilities.

(b) Those districts that have a recent history of failure in bonding and tax increase elections.

(c) Those districts required to replace school facilities due to Field Act requirements.

(d) Those districts wishing to replace facilities that are antiquated and structurally unsound.

(e) Those districts seeking new ways to improve the quality of education.

(f) Those districts wishing to obtain space for expanding school offerings by adding programs such as Early Childhood Education.

(g) Those districts that face a combination of some of the aforementioned.

Year-Round School Cost Studies

Cost is usually one of the elements considered when a district discusses whether to initiate a schedule change at one or more schools. Most often there is not a full cost study but just a paragraph or two on the expected incremental costs. Regardless of the presence of the economic feasibility study, rarely do districts evaluate the actual costs after the schedule change takes place. The studies presented below are prominent among the very few evaluations we have come across.

Valley View School District, Romeoville, Illinois

In June 1970, the Valley View School District put its five elementary and one junior high school on a year-round schedule. They were the first schools in the country to adopt the 45-15 program (the one used at Pajaro Valley Unified School District); therefore, their cost experience is of particular significance to this study.

Valley View converted to the year-round schedule because of explosive enrollment growth (Romeoville is a Chicago suburb). We have not found a report of the actual construction savings (avoided classroom expense). The district expected to save the expense of 60 classrooms at a total cost of between $5 and $6 million. (Hermansen and Gove, 1971, p. 120)

In the Valley View evaluation, the basic operating cost findings were:

> ... on a per pupil cost basis, the year-round school has apparently slowed the rising per pupil cost that generally accompanies school operation from year to year. That is, although there has been no real dollar savings per pupil, the "45-15" year-round school plan has resulted in a smaller increase in cost per pupil as compared to the increase between the two previous years. (Valley View SD, September 1972, p. 21)

The Valley View cost analysis takes a longitudinal form. TCS costs from 1969 are compared to 1970 YRS costs. All the costs are expressed in constant dollars. This approach, coupled with the selection of cost increments as the unit of analysis, tends to mask significant effects that are not schedule related:

(1) Certificated Personnel Costs--Salaries of regular elementary school teachers increased by 1.33% from 1968-69 to 1969-70 and by 10.48% from 1969-70 to 1970-71. The evaluation offers no explanation for this change. However, the Hermansen and Gove book suggests two reasons:

- Teacher salary negotiations were completed in June 1970, resulting in a new salary schedule (p. 93).
- Conversion to a year-round schedule allowed some teachers to "extend" their contracts:

> For the 1970-71 school year, 61.3 percent of the primary grade teachers elected to work 184 days--the regular school year ... some 25.3 percent of the teachers elected to work 244 days ... the remainder of the primary teachers (13.3 percent) worked 199, 214, or 229 days. (p. 95)

Thus, 38.7 percent of the teachers worked a contract greater than the regular 184-day contract. We believe it most likely that the more expensive Valley View teachers were the ones who extended their contracts.

(2) Transportation Costs--Enrollment in Valley View increased from 4,965 in 1968 to 5,896 in 1970. However, transportation cost went from $24.23 per pupil in 1968 to $12.06 in 1969 to $14.66 in 1970. Hermansen and Gove observe that Valley View

> switched from a private contractor to its own operation of school buses for the 1969-70 school year. The district purchased twenty buses ... at that time, and has handled the increase from 5,166 students in 1969 to 6,950 students, February 1, 1971, without the purchase of additional buses, or the employment of additional drivers or supervisors. The earnings of the bus drivers have increased, however, approximately 34 percent, since the drivers are now working 240 days a year .... (p. 118) [emphasis added]

The analysis is confounded by the change from a private bus contractor to school-owned and -operated buses. Nonetheless, it is clear that the year-round schedule has permitted Valley View to increase the number of students transported without an increase in the number of buses.

The basic problem with the study is that it does not compare the delivery of equivalent programs to equal populations under different schedules.

Mills E. Godwin Middle School, Prince William County School District, Manassas, Virginia

In July 1971, the 45-15 schedule was implemented in four Prince William County schools. This was done because the district had reached the limit of its bonded indebtedness and faced enrollment increases. In 1972, Blair Curry and John Sweeney of Education Turnkey Systems conducted a cost analysis of one of the four 45-15 schools, Mills E. Godwin Middle School (Curry and Sweeney, 1972). They report a 4.2% saving in school facilities at Godwin school as follows:

> The requirements for classroom areas per enrollee under the 45-15 plan are only 75% as great as under a traditional calendar. This fact is translated into a per-pupil savings of $11.62 in the construction dollars required annually. (p. 28)

Curry and Sweeney found a net saving of $109.46 in overall resource cost per pupil. Individual components of that saving ranged from $0.16 per pupil for cafeteria equipment to $33.84 per pupil for teachers.

This study compares the situation at an actual school on a year-round schedule with a simulation of the circumstances at the same school under a traditional schedule. We found several methodological problems in the study:

(1) The critical variables are presented exclusively in terms of the Education Turnkey model. Therefore, it is not possible to determine the Godwin enrollment before and after the implementation of YRS, actual budgeting costs, building utilization, and so forth. For this reason, it is difficult to examine study findings from alternative perspectives.

(2) It appears that the YRS enrollment at Godwin does not occupy all the classrooms. To deal with this consideration, Curry and Sweeney define the classrooms not used for basic instruction as "slack" and comment:

> Under the assumption that Prince William County has divested itself of such slack, the requirements for classroom area per enrollee under the 45-15 plan are only 75% as great as under a traditional calendar. (p. 28)

Thus, the cost analysis does not compare equivalent programs. (It is unrealistic to expect that the "slack" classrooms are merely standing empty and are not being put to productive use by Godwin school administrators.)

(3) Curry and Sweeney report that "Some of the cost differentials, however, will be the result of program changes caused by 45-15 ..." (p. 17). Unfortunately, these changes are not elucidated.

(4) The YRS enrollment is assumed to be one-third greater than that under a traditional program. Thus, cost comparisons between the schedules are based on two different enrollment levels; as noted in Chapter 2, this confounds the analysis of certain cost components such as transportation.

(5) The study makes unrealistic assumptions about salaries, particularly teachers' salaries.

> Under the 45-15 calendar, year-round teachers taught classes for all of their 241 days with no nonteaching days. The average teacher, therefore, teaches almost 34% (241 - 180) ÷ 180 more classes under the year-round contract. From the point of view of the school system, this represents a considerable saving in teacher cost, since each teacher is serving 34% more students but the school system has to pay only 25% more in salary for the teacher. (p. 20)

The primary reason for these savings is that TCS teachers have 13 nonteaching days; these are eliminated when they extend

their contracts. We expect that these YRS teachers will not consent to teaching without nonteaching days for very long.

Hayward Unified School District

The remaining three cost analyses concern California LEAs on year-round schedules. The first California district to adopt a year-round schedule was the Hayward district, which in 1968 adopted an extended school year schedule at Park School, with a primary enrollment of 450. The school year consisted of four mandatory quarters of approximately 50 days each with a 3-week break between quarters. Children in the Park School attended 197 days of school in 1968-69 as compared with 175 days for other children in the district (Hayward USD, 1970, p. 7).

Hayward compared annual expenditures per ADA at Park School (where the base was 197 days) with the average district expenditure (where the base was 176 days). Not surprisingly, the Park School expenditures were higher ($592.47 versus $538.12). However, on the basis of unit cost per day of student instruction received, Park School was less expensive ($592.47 ÷ 197 = $3.01 vs. $538.12 ÷ 175 = $3.08). This no doubt occurs because the fixed cost is spread over a large base (i.e., the marginal cost per day of student instruction decreases as the length of the term increases).

The Hayward evaluation represents another illustration of the difficulties encountered* when a traditional program is compared with a year-round program (in this case, extended-year program) and the actual educational services provided are not held constant (i.e., a 197-day program is not educationally equivalent to a 176-day program).

Fairfield-Suisun (Marin County, California)

The Fairfield-Suisun district has two elementary schools operating on the 45-15 plan. For the 1973-74 school year, the principal evaluator, Dr. Michael Scriven of the University of California at Berkeley, reported

*See Chapter 2.

a net per-pupil saving on operating costs. A 12% to 15% increase in total annual operating costs was offset by 18% to 21% more pupils. "If new building had been put up, with that much capacity, the operating costs would have gone up nearly 30%" (p. 22). He also notes that the incremental increase in utilities costs (due to year-round usage) were minute. This is particularly significant because Fairfield-Suisun has extensive air conditioning.

This study is written in a straightforward manner for a lay audience. The cost analysis is not rigorous and lacks much of the detailed information we would like; however, the basic approach is sound: compare the costs of YRS with those of TCS serving equivalent populations. Also, Scriven raises the significant point that the opportunity costs (savings) of avoided school construction are building and land costs plus the tax revenue from the site.

San Diego Unified School District--1974 Evaluation

Seven San Diego schools operated on 45-15 schedules during 1973-74. In December 1974 the operation was evaluated from an excess cost perspective (essentially a longitudinal perspective). An excess cost is defined as "a cost which would not be encountered, if Year-Round Schools were not in operation." This cost study has several problems:

(1) There is no consideration of capital costs.

(2) There is no mention of the transition costs of converting to a year-round calendar.

(3) Nowhere in the study is there an indication that equivalent programs are being compared.

(4) The costs are not adjusted to reflect the additional population served. For example, suppose that under a traditional program 400 students are served for $400,000 and under a year-round program 500 students are served for $450,000. The excess cost is $50,000. However, the cost per student decreased from $1,000 to $900.

(5) There is no consideration of costs in areas such as transportation.

Appendix B

PAJARO VALLEY UNIFIED SCHOOL DISTRICT
AMESTI SCHOOL COST ANALYSIS

Introduction

The Amesti facility is situated on a 12.5-acre site near the intersection of Amesti and Green Valley Roads in the community of Freedom. Amesti was part of the Freedom School District, which was consolidated into the Pajaro Valley Unified School District in 1965.

Amesti School consists of 15 classrooms, a kindergarten room, and administrative offices. The kindergarten occupies approximately 1,200 square feet. The other 15 classrooms each occupy over 900 square feet. Three of these classrooms are combined for a library/learning center. These rooms would normally be allocated as classroom, library, and storage rooms. Their combined use is overseen by a teacher who is also a librarian. This teacher is assigned 29 children who are actually distributed among the other classes. (This works because there are usually more than 29 children in the learning center.) The library/learning center serves several purposes:

- In one corner there is an "English as a second language area" (financed by Title I Migrant Education funds).
- There is a small space reserved for use by students who have a learning disability.
- A large space is devoted to special learning/reading equipment, such as battery-powered cassette readers with "view masters" screens. Most of this equipment was purchased with funds provided by Title II of the Elementary and Secondary Education Act or the National Defense Education Act.
- Much of the space is used for a conventional (expanded) library.

Of the 16 classrooms at Amesti, 14 are currently in use for basic instruction. We assume that the other two classrooms would continue their current use if Amesti were to revert to a traditional calendar.

In October 1971, enrollment at Amesti was at capacity for the facility, approximately 450 students. Since the Amesti attendance area contained 565 children, it was necessary to send 115 "surplus" children to Salsipuedes and Corralitos schools. With the implementation of a year-round plan, the theoretical capacity of the school was increased to approximately 550 students. It should be noted that in 1975-76, 30 students from the Amesti attendance area were housed at the Bradley and Salsipuedes elementary schools.

Cost Analysis

Capital Costs

If Amesti school were to revert to a traditional schedule, it would serve 550 children (80 kindergarten and 470 grades 1-6). This would require the construction of 5 classrooms (1 kindergarten room and 4 elementary rooms). These rooms would cost $453,347:

	Classrooms	× Children per Class	× Square Feet per Child	× Dollars per Square Foot*	= Construction Cost
Kindergarten	1	29	55	$55.32	$ 88,235
Grades 1-6	4	30	55	55.32	365,112
Total					$453,347

Since ample land is available, there would be no land acquisition cost. Considering bond broker's fee and bond interest, the annual payment would be $39,525 (6% interest, 20-year bond).

Operating Costs

Classroom Teachers--There are 20 full-time teaching positions allocated to Amesti. At the standard contract of 176 days, there are 3,520 teaching days planned. This time was divided among 27 teachers: only

*Includes site preparation, construction, furnishing, etc. See Volume III.

10 teachers worked a 176 day contract; 5 had longer contracts and 12 worked shorter.

A total of 1,760 teaching days were represented by nonstandard contracts. (Of this amount 880 days--equivalent to 5 full-time teachers--were contract extensions or short-time contracts.) The total compensation involved was $61,387 (see Table B-1). If these teaching days had been provided by teachers working under standard contracts, they would amount to $87,376. Thus there was a saving of $25,039 due to the year-round schedule. This is calculated as follows:

(1) 880 days of contract extension = $55,678.23 incremental salaries

(2) Total salaries - incremental salaries = salaries for teachers working regular contracts

$289,907.76 - $55,678.23 = $234,229.53

(3) Regular contract salaries ÷ regular contract days = regular daily salary

$234,229.53 ÷ (3,520 - 880) = $88.73

(4) Regular daily salary x contract extension days = simulated salary cost

$88.73 x 880 = $78,082.40

(5) Simulated salary for one teacher

176/880 x $78,082.40 = $15,616.48

(6) Benefits for one teacher @ salary of $15,614.48 = $1,858.67

(7) Total compensation for one teacher = $15,616.48 + 1,858.67 = $17,475.15

(8) Total compensation for five teachers = $87,375.75

(9) YRS Compensation for contract extensions = $61,386.66

(10) Saving due to YRS = $87,376 - $61,387 = $25,039

Administrative Staff--There are five types of salary expense incurred at Amesti (Table B-2):

- The principal's salary was extended 22 days--a compensation expenditure of $2,324.38.
- There was additional expense for a head teacher (to act on behalf of the principal during the few days each year she is absent)--$863.

Table B-1

COMPENSATION FOR AMESTI TEACHERS WITH NONSTANDARD CONTRACTS

	SALARY COSTS					BENEFITS COSTS			
Name	(A) Total Days Worked	(B) Daily Salary	(C) Total Salary Under Standard Contract	(D) Total Salary Under Actual Contract (Col A × Col B)	(E) Incremental Salary (Col D - Col C)	(F) Incremental Retirement Cost	(G) Incremental Health & Life Insurance Cost	(H) Incremental Long-Term Disability Cost	(I) Incremental Workers' Compensation Cost
1	30	54.36	[illegible]	1,630.80	1,630.80		125.10	11.42	14.51
2	118	58.23	[illegible]	6,871.14	6,871.14	384.79	493.02	48.10	61.15
3	176.5	97.11	17,091.36	17,139.92	48.56			0.34	0.43
4	14.5	72.01	0	1,044.15	1,044.15		66.23	7.31	9.29
5	146	48.30	0	7,051.80	7,051.80	394.90	610.75	49.36	62.76
6	113	70.25	0	7,938.25	7,938.25	444.55	478.30	55.57	70.65
7	10	99.00	0	990.00	990.00		44.15	6.93	8.81
8	201	69.65	12,258.40	13,999.65	1,741.25			12.19	15.50
9	58	48.29	0	2,800.82	2,800.82		242.83	19.61	24.93
10	62	57.45	0	3,561.90	3,561.90		264.91	24.93	31.70
11	224	87.96	15,480.96	19,703.04	4,222.08			29.56	37.58
12	20	74.93	0	1,498.60	1,498.60		88.30	10.49	13.34
13	30	72.80	0	2,184.00	2,184.00		125.10	15.29	19.44
14	5	56.67	0	283.35	283.35		22.08	1.98	2.52
15	137	60.50	0	8,288.50	8,288.50	464.16	573.96	58.02	73.77
16	191	57.45	10,111.20	10,972.95	861.75			6.03	7.67
17	224	97.11	17,091.36	21,752.64	4,661.28			32.63	41.49
TOTAL	1,760.0	$	$	$	$ 55,688.40	$1,688.40	$ 3,134.73	$ 389.76	$ 495.54

Total $61,386.66

Table B-2

COMPENSATION FOR AMESTI ADMINISTRATIVE STAFF

Name	SALARY COSTS						BENEFITS COSTS			
	(A) Days in Standard Contract	(B) Days in Actual Contract	(C) Daily Salary	(D) Total Salary Under Standard Contract (Col A × Col C)	(E) Total Salary Under Actual Contract (Col B × Col C)	(F) Incremental (Contract Extension) Cost (Col E - Col D)	(G) Incremental Retirement Cost	(H) Incremental Health & Life Insurance Cost	(I) Incremental Long-Term Disability Cost	(J) Incremental Workers' Compensation Cost
Secretary	10 months	12 months	689.00	6,890.00	8,268.00	1,378.00	105.14	80.75	9.65	12.34
Typist Clerk	10 months	12 months	203.25	2,032.50	2,439.00	406.50	31.02	23.82	2.85	3.62
Library Clerk	10 months	12 months	135.50	1,355.00	1,626.00	271.00	20.68	15.88	1.90	2.41
Yard Work	176	235	2.80	492.80	658.00	165.20	12.61	9.68	1.16	1.47
Utility Worker	0	11.5	30.00	0	345.00	345.00	26.32	0	2.42	3.07
Head Teacher	0	10				862.92				
Custodian	10 months	12 months	673.00	6,057.00	8,076.00	2,019.00	158.00	128.00	10.00	14.00
Principal	204	226	104.00	21,216.00	23,504.00	2,288.00			16.02	20.36
TOTAL			$	$	$	$ 7,735.62	$ 353.77	$ 258.13	$ 44.00	$ 57.27

Note: Totals do not include Amesti's share of district-level costs.

- A secretary, two clerks, and two yard workers had their contracts extended--a compensation expenditure of $2,932.49.
- One custodian had his contract extended--a compensation expenditure of $2,315.39.
- A psychologist, music teacher, speech therapist, and speech correctionist had their contracts extended to serve the five year-round schools--Amesti's pro rata share of the compensation is $2,350.79.

The total incremental expense is $10,786. If the district reverted to a traditional schedule, the administrative staff needed at the new school would require compensation in the amount of $46,760.44. Amesti's pro rata share is $9,352.09. Thus, the YRS causes a net annual expense of $1,433.

Transportation--The total incremental expenditure on transportation due to the year-round calendar is $27,042.92 ($12,042 for supplies plus $15,000.92 in transportation personnel compensation). Amesti's pro rata share of this is $5,409.

Utilities--The Amesti electricity, gas, and water incremental expense due to YRS (summer months) is $4,961.41. The simulated incremental expense for reversion to TCS (more classrooms) is $5,915. Thus, YRS yields a net annual saving of $954.

Transition Costs

The total district transition cost is $9,479.69. Amesti's pro rata share is $1,896. Amortized, this is $165 per year (6%, 20 years).

Summary

Combining the above calculations shows that Amesti realized an annual saving of $59,511:

Avoided capital costs	$39,525
Avoided operating costs	20,151
Transition expense	(165)
Total	$59,511

Table C-1

PVUSD WORKSHEET FOR CLASSROOMS

Current Classroom Use		Amesti						Aromas						Bradley						Calabasas*						Subtotal					
		K	1-6	7-8	9-12	Special	Total	K	1-6	7-8	9-12	Special	Total	K	1-6	7-8	9-12	Special	Total	K	1-6	7-8	9-12	Special	Total	K	1-6	7-8	9-12	Special	Total
(1) Available Classrooms	+	1	15				16	1	11				12	1	12				13		12				12	3	50				53
(2) In Use Single Session	-	1	13				14	1	11				12	1	12				13		12				12	3	48				51
(3) In Use Double Session x2*	-	0	0				0	0	0				0	0	0				0		0				0	0	0				0
(4) Surplus Classrooms	=	0	2				2	0	0				0	0	0				0		0				0	0	2				2
Current Surplus Use																															
(5) Compensatory Education			0				0		0				0		0				0		0				0		0				0
(6) Vocational Education			0				0		0				0		0				0		0				0		0				0
(7) Migrant			0				0		0				0		0				0		0				0		0				0
(8) Bilingual			0				0		0				0		0				0		0				0		0				0
(9) Library			2				2		0				0		0				0		0				0		2				2
(10) Other			0				0		0				0		0				0		0				0		0				0
Projected Surplus Use																															
(11) Available Classrooms	+	1	15				16	1	11				12	1	12				13		12				12	3	50				53
(12) Same Surplus Use--TCS	-	0	2				2	0	0				0	0	0				0		0				0	0	2				2
(13) Net Available--TCS	=	1	13				14	1	11				12	1	12				13		12				12	3	48				51
Projected Classroom Use--TCS																															
(14) Enrollment served	+	80	468				548														448				448						
(15) Staffing Ratio	%	55	29				-														29				29						
(16) Classrooms Needed	=	2	16				17														15				15						
(17) Net Available--TCS	-	1	13				14								-						12				12						
(18) Classroom Deficit	=	1	3				4						0						0		3				3	1	6				7

* If not Kindergarten

Table C-1 (Continued)

Current Classroom Use		Freedom K	Freedom 1-6	Freedom 7-8	Freedom 9-12	Freedom Special	Freedom Total	Hall Elementary K	Hall Elementary 1-6	Hall Elementary 7-8	Hall Elementary 9-12	Hall Elementary Special	Hall Elementary Total	Hyde K	Hyde 1-6	Hyde 7-8	Hyde 9-12	Hyde Special	Hyde Total	Linscott K	Linscott 1-6	Linscott 7-8	Linscott 9-12	Linscott Special	Linscott Total	Subtotal K	Subtotal 1-6	Subtotal 7-8	Subtotal 9-12	Subtotal Special	Subtotal Total
(1) Available Classrooms	+	2	19			1	22	1	18				19	1	11			1	13	1	4				5	5	52			2	59
(2) In Use Single Session	-	2	15			1	18	1	18				19	1	11			1	13	1	4				5	5	48			2	55
(3) In Use Double Session x2*	-																														
(4) Surplus Classrooms	=	0	4			0	4	0	0				0	0	0			0	0	0	0				0	0	4			0	4
Current Surplus Use																															
(5) Compensatory Education			2				2		0				0		0				0		0				0		2				2
(6) Vocational Education			0				0		0				0		0				0		0				0		0				0
(7) Migrant			0				0		0				0		0				0		0				0		0				0
(8) Bilingual			0				0		0				0		0				0		0				0		0				0
(9) Library			0				0		0				0		0				0		0				0		0				0
(10) Other			2				2		0				0		0				0		0				0		2				2
Projected Surplus Use																															
(11) Available Classrooms	+	2	19			1	22	1	18				19	1	11			1	13	1	4				5	5	52			2	59
(12) Same Surplus Use--TCS	-	0	2				2	0	0				0	0	0			0	0	0	0				0	0	4			0	4
(13) Net Available--TCS	=	2	17			1	20	1	18				19	1	11			1	13	1	4				5	5	48			2	55
Projected Classroom Use--TCS																															
(14) Enrollment served	+	101	537			8	646							62	374			12	438												
(15) Staffing Ratio	%	55	29			8	-							55	29			12	-												
(16) Classrooms Needed	=	2	19			1	22							1	13			1	15												
(17) Net Available--TCS	-	2	17			1	20							1	11			1	13												
(18) Classroom Deficit	=	0	2			0	2						0	0	2			0	2						0		4				4

* If not Kindergarten

Table C-1 (Continued)

Current Classroom Use		Radcliff K	Radcliff 1-6	Radcliff 7-8	Radcliff 9-12	Radcliff Special	Radcliff Total	Rio Del Mar K	Rio Del Mar 1-6	Rio Del Mar 7-8	Rio Del Mar 9-12	Rio Del Mar Special	Rio Del Mar Total	Salsipuedes K	Salsipuedes 1-6	Salsipuedes 7-8	Salsipuedes 9-12	Salsipuedes Special	Salsipuedes Total	Thornely K	Thornely 1-6	Thornely 7-8	Thornely 9-12	Thornely Special	Thornely Total	Subtotal K	Subtotal 1-6	Subtotal 7-8	Subtotal 9-12	Subtotal Special	Subtotal Total
(1) Available Classrooms	+	1	7				8	1	16				17	1	13	6		1	21	0	3				3	3	39	6		1	49
(2) In Use Single Session	-	1	7				8	1	16				17	1	13	6		1	21	0	3				3	3	39	6		1	49
(3) In Use Double Session x2*	-	0	0					0	0				0	0	0	0		0	0	0	0				0	0	0	0		0	0
(4) Surplus Classrooms	=	0	0				0	0	0				0	0	0	0		0	0	0	0				0	0	0	0		0	0
Current Surplus Use																														
(5) Compensatory Education			0				0		0				0		0				0		0				0		0				0
(6) Vocational Education			0				0		0				0		0				0		0				0		0				0
(7) Migrant			0				0		0				0		0				0		0				0		0				0
(8) Bilingual			0				0		0				0		0				0		0				0		0				0
(9) Library			0				0		0				0		0				0		0				0		0				0
(10) Other			0				0		0				0		0				0		0				0		0				0
Projected Surplus Use																														
(11) Available Classrooms	+	1	7				8	1	16				17	1	13	6		1	21	0	3				3	3	39	6		1	49
(12) Same Surplus Use--TCS	-	0	0				0	0	0				0	0	0	0		0	0	0	0				0	0	0	0		0	0
(13) Net Available--TCS	=	1	7				8	1	16				17	1	13	6		1	21	0	3				3	3	39	6		1	49
Projected Classroom Use--TCS																														
(14) Enrollment served	+																													
(15) Staffing Ratio	%																													
(16) Classrooms Needed	=																													
(17) Net Available--TCS	-																													
(18) Classroom Deficit	=						0						0						0						0						0

* If not Kindergarten

Table C-1 (Continued)

Current Classroom Use		MacQuiddy K	MacQuiddy 1-6	MacQuiddy 7-8	MacQuiddy 9-12	MacQuiddy Special	MacQuiddy Total	Mar Vista K	Mar Vista 1-6	Mar Vista 7-8	Mar Vista 9-12	Mar Vista Special	Mar Vista Total	Mintie White K	Mintie White 1-6	Mintie White 7-8	Mintie White 9-12	Mintie White Special	Mintie White Total	Pajaro K	Pajaro 1-6	Pajaro 7-8	Pajaro 9-12	Pajaro Special	Pajaro Total	Subtotal K	Subtotal 1-6	Subtotal 7-8	Subtotal 9-12	Subtotal Special	Subtotal Total
(1) Available Classrooms	+	1	13				14	1	16			1	18	1	15				16	1	15				16	4	59			1	64
(2) In Use Single Session	-	1	13				14	1	15			1	17	1	13				14	1	15				16	4	56			1	61
(3) In Use Double Session x2*	-	0	0				0	0	0			0	0	0	0				0	0	0				0	0	0			0	0
(4) Surplus Classrooms	=	0	0				0	0	1			0	1	0	2				2	0	0				0	0	3			0	3
Current Surplus Use																															
(5) Compensatory Education			0				0		0				0		2				2		0				0		2				2
(6) Vocational Education			0				0		0				0		0				0		0				0		0				0
(7) Migrant			0				0		0				0		0				0		0				0		0				0
(8) Bilingual			0				0		0				0		0				0		0				0		0				0
(9) Library			0				0		0				0		0				0		0				0		0				0
(10) Other			0				0		1				1		0				0		0				0		1				1
Projected Surplus Use																															
(11) Available Classrooms	+	1	13				14	1	16			1	18	1	15				16	1	15				16	4	59			1	64
(12) Same Surplus Use--TCS	-	0	0				0	0	1			0	1	0	2				2	0	0				0	0	3			0	3
(13) Net Available--TCS	=	1	13				14	1	15			1	17	1	13				14	1	15				16	4	56			1	61
Projected Classroom Use--TCS																															
(14) Enrollment served	+																														
(15) Staffing Ratio	%																														
(16) Classrooms Needed	=																														
(17) Net Available--TCS	-																														
(18) Classroom Deficit	=						0						0						0						0						0

* If not Kindergarten

Table C-1 (Continued)

Current Classroom Use		Valencia K	Valencia 1-6	Valencia 7-8	Valencia 9-12	Valencia Special	Valencia Total	Aptos Jr. H.S. K	Aptos Jr. H.S. 1-6	Aptos Jr. H.S. 7-8	Aptos Jr. H.S. 9-12	Aptos Jr. H.S. Special	Aptos Jr. H.S. Total	E.A. Hall Jr. HS K	E.A. Hall Jr. HS 1-6	E.A. Hall Jr. HS 7-8	E.A. Hall Jr. HS 9-12	E.A. Hall Jr. HS Special	E.A. Hall Jr. HS Total	Rolling Hills Jr. HS K	Rolling Hills Jr. HS 1-6	Rolling Hills Jr. HS 7-8	Rolling Hills Jr. HS 9-12	Rolling Hills Jr. HS Special	Rolling Hills Jr. HS Total	Subtotal K	Subtotal 1-6	Subtotal 7-8	Subtotal 9-12	Subtotal Special	Subtotal Total
(1) Available Classrooms	+		17	3			20			15			15			22			22			19			19		17	59			76
(2) In Use Single Session	-		14	3			17			15			15			22			22			18			18		14	58			72
(3) In Use Double Session x2*	-															0			0			0			0		0	0			0
(4) Surplus Classrooms	=		3	0			3			0			0									1			1		3	1			4
Current Surplus Use																															
(5) Compensatory Education			0				0			0			0			0			0			0			0		0	0			0
(6) Vocational Education			0				0			0			0			0			0			0			0		0	0			0
(7) Migrant			0				0			0			0			0			0			.5			.5		0	.5			.5
(8) Bilingual			0				0			0			0			0			0			0			0		0	0			0
(9) Library			1				1			0			0			0			0			0			0		1	0			1
(10) Other			2				2			0			0			0			0			.5			.5		2	.5			2.5
Projected Surplus Use																															
(11) Available Classrooms	+		17	3			20			15			15			22			22			19			19		17	59			76
(12) Same Surplus Use--TCS	-		3				3			0			0			0			0			1			1		3	1			4
(13) Net Available--TCS	=		14	3			17			15			15			22			22			18			18		14	58			72
Projected Classroom Use--TCS																															
(14) Enrollment served	+																					588									
(15) Staffing Ratio	%																					26									
(16) Classrooms Needed	=																					23									
(17) Net Available--TCS	-														-							18									
(18) Classroom Deficit	=						0						0						0			5			5				5		5

* If not Kindergarten

Table C-1 (Concluded)

Current Classroom Use		Aptos H.S. K	1-6	7-8	9-12	Special	Total	Renaissance H.S. K	1-6	7-8	9-12	Special	Total	Watsonville HS K	1-6	7-8	9-12	Special	Total	Sub Total K	1-6	7-8	9-12	Special	Total	District Total K	1-6	7-8	9-12	Special	Total
(1) Available Classrooms	+				36		36				12		12				110	5	115				158	5	163	15	217	65	158	9	464
(2) In Use Single Session	-				36		36				12		12				110	5	115				158	5	163	15	205	64	158	9	451
(3) In Use Double Session x2*	-				0		0				0		0				0	0	0				0	0	0	0	0	0	0	0	0
(4) Surplus Classrooms	=				0		0				0		0				0	0	0				0	0	0	0	12	1	0	0	13
Current Surplus Use																															
(5) Compensatory Education					0		0				0		0				0		0				0		0		4	0			4
(6) Vocational Education					0		0				0		0				0		0				0		0		0	0			0
(7) Migrant					0		0				0		0				0		0				0		0		0	.5			.5
(8) Bilingual					0		0				0		0				0		0				0		0		0	0			0
(9) Library					0		0				0		0				0		0				0		0		3	0			3
(10) Other					0		0				0		0				0		0				0		0		5	.5			5.5
Projected Surplus Use																															
(11) Available Classrooms	+				36		36				12		12				110	5	115				158	5	163	15	217	65	158	9	464
(12) Same Surplus Use--TCS	-				0		0				0		0				0	0					0	0	0	0	12	1	0	0	13
(13) Net Available--TCS	=				36		36				12		12				110	5	115				158	5	163	15	205	64	158	9	451
Projected Classroom Use--TCS																															
(14) Enrollment served	+																														
(15) Staffing Ratio	%																														
(16) Classrooms Needed	=																														
(17) Net Available--TCS	-																														
(18) Classroom Deficit	=						0						0						0						0	1	10		5		16

* If not Kindergarten

Table C-2

PVUSD WORKSHEET FOR CONSTRUCTION OF NEW SCHOOL

Grade Group	(1) Classrooms Required	×	(2) Children per Class	×	(3) Square Feet per Child	=	(4) TOTAL Square Feet	×	(5) $ per Square Foot	=	(6) Construction Cost
Kindergarten	1		29*		55		1595		55.32		$ 88,235.40
1-6	10		29		55		15,950		55.32		882,354
7-8											
9-12											
Special											

(7)	Total Construction Cost	$ 970,589.40
(8)	Cost of Land Acquisition	0
(9)	Total Development Cost	$ 970,589.40

*For double-session Kindergarten, divide the number of children by 2

Table C-3

PVUSD WORKSHEET FOR CONSTRUCTION OF NEW CLASSROOMS

Grade Group	(1) Classrooms Required	×	(2) Children per Class *	×	(3) Square Feet per Child	=	(4) TOTAL Square Feet	×	(5) $ per Square Foot	=	(6) Construction Cost
Kindergarten	____		____		____		____		____		$ ____
1-6	____		____		____		____		____		____
7-8	5		26		75		9750		56.83		554,124.27
9-12	____		____		____		____		____		____
Special	____		____		____		____		____		____

(7) Total Construction Cost $554,124.27

*For double-session Kindergarten, divide the number of children by 2

Table C-4

PVUSD WORKSHEET FOR CALCULATION OF ANNUAL CAPITAL COST

(1)	PRINCIPAL	$ 1,524,714	
(2)	BOND BROKER'S FEE	60,989	
(3)	TOTAL BOND AMOUNT (Line 1 + Line 2)		$ 1,585,703
(4)	ANNUAL PAYMENT		
	4a. Bond Life	20 years	
	4b. Bond Interest Rate	6%	
	4c. Present Value	11.47	
	4d. Annual Payment (Line 3÷Line 4c)		$ 138,247.87
(5)	TOTAL PAYOUT (Line 4axLine 4d)	$ 2,764,957	
(6)	TOTAL BOND INTEREST (Line 5 - Line 3)	$ 1,179,254	

Table C-5

DISTRICT WORKSHEET FOR COMPARING CURRENT OPERATING COSTS WITH ESTIMATED COSTS UNDER EXPANDED TCS

Accounting Category	(1) Actual District Expenditures	(2) Actual Costs for Inter Session	(3) Actual Costs for Summer Session	(4) Actual Costs for Mandatory Services (C1-C2-C3)	(5) YRS Incremental Operating Costs	(6) Core Operating Costs (C4-C5)	(7) Estimated Costs for Addl Schools & Classrooms under Expanded TCS	(8) Estimated Costs for Mandatory Services under Expanded TCS (C6+C7)	(9) Estimated Costs for Summer School under Expanded TCS	(10) Estimated District Expenditures under Expanded TCS (C8+C9)
1000 Certificated Salaries	10,075,459.0	43,267.55	102,030.40	9,930,161.05	129,648.0	9,800,513.05	145,256.0	9,945,769.05	145,258.69	10,091,027.74
2000 Classified Salaries	3,150,740.0	7,969.19	1,931.99	3,140,938.82	28,867.0	3,111,971.82	18,093.0	3,130,064.82	2,750.78	3,132,815.60
3000 Employee Benefits	1,890,114.0	---	---	1,890,114.00	10,521.0	1,879,593.00	21,357.0	1,900,950.00	---	1,900,950.00
4000 Books, Supplies and Equipment Replacement	1,163,808.0	5,274.27	30,908.94	1,127,522.79	12,042.0	1,115,580.79	---	1,115,580.79	44,005.17	1,159,585.96
5000 Contracted Services	737,541.0	52.34	10,858.00	726,630.66	47,643.0	678,987.66	57,408.0	736,395.66	15,459.10	751,854.76
6000 Sites, Building	222,022.0	195.04	---	221,826.96	---	221,826.96	---	221,826.96	---	221,826.96
7000 Other Outgo	1,008,767.0	---	---	1,008,767.00	---	1,008,767.00	---	1,008,767.00	---	1,008,767.00
TOTAL	18,248,449.0	56,758.39	145,729.33	18,045,961.28	228,721.0	17,817,240.28	242,114.0	18,059,354.28	207,473.74	18,266,828.02

Table C-6

COMPUTATION OF ACTUAL COSTS

Source(s) of Information:

Pajaro Valley Unified School District 1976/77 Adopted Budget
1976/76 Actual Expenditures

	1100	Teacher's Salaries	8,637,528
	1200	School Administration Salary	701,783
	1300	Supervisors' Salaries	200,575
	1400	Media Salaries	92,390
	1500	Guidance Salaries	321,832
	1600	Health Services	61,767
	1700	Administration	32,084
	1800	Director of Education	27,500
1000		TOTAL CERTIFICATED SALARIES	10,075,459
	2100	Teacher Aide Salaries	588,564
	2200	Management Salaries	122,167
	2300	Clerical Salaries	818,082
	2400	Maintenance & Operation Salaries	939,729
	2500	Food Service	-
	2600	Transportation Salaries	445,651
	2900	Noon Supervisors	236,547
2000		TOTAL CLASSIFIED SALARIES	3,150,740
	3100	Retirement Annuity Fund (STRS)	551,177
	3200	Classified Retirement (PERS)	192,464
	3300	OASDHI	136,520
	3400	Health & Welfare Benefits	926,255
	3500	State Unemployment Insurance	2,492
	3600	Workmen's Compensation	81,206
	3900	Other Benefits	
3000		TOTAL EMPLOYEE BENEFITS	1,890,114
	4100	Supplementary Textbooks	34,644
	4200	Other Books	33,871
	4300	Instructional Supplies	350,548
	4400	Instructional Media Materials and Supplies	41,748
	4500	Other Supplies	301,339
	4600	Transportation Supplies	213,084
	4700	Food Services	116,387
	4800	Equipment Replacement	72,185
4000		TOTAL BOOKS, SUPPLIES AND EQUIPMENT REPLACEMENT	1,163,806

Table C-6 (Concluded)

	5100	Contracts for Personal Services	82,097
	5200	Travel & Conferences	65,477
	5300	Dues & Memberships	2,302
	5400	Insurance	129,085
	5500	Utilities	338,857
	5600	Leases	103,352
	5700	Legal Audit & Election	16,371
	5800	Other Services & Expenses	
5000		TOTAL CONTRACTED SERVICES	737,541
	6100	Sites and Improvements of Sites	11,580
	6200	Buildings and Improvements of Buildings	123
	6300	Books/Media for New or Expanded Libraries	100,907
	6400	Equipment	109,412
6000		TOTAL CAPITAL OUTLAY	222,022
	7100	Debt Service	311,015
	7200	Outgoing Tuition	44,855
	7300	Interfund Transfers	567,805
	7400	Other Transfers	85,092
	7900	Contingency	
7000		TOTAL ALL OTHER OUTGO	1,008,767
TOTAL EXPENDITURES			18,248,449
	9000	Reserves & Stores	-18,651
TOTAL EXPENDITURES & RESERVES			18,229,798

Table C-7

COMPUTATION OF INTERSESSION COSTS

Source(s) of Information:

	1100	Teacher's Salaries	43,267.55
	1200	School Administration Salary	
	1300	Supervisors' Salaries	
	1400	Media Salaries	
	1500	Guidance Salaries	
	1600	Health Services	
	1700	Administration	
1000		TOTAL CERTIFICATED SALARIES	43,267.55
	2100	Teacher Aide Salaries	7,587.61
	2200	Management Salaries	
	2300	Clerical Salaries	381.58
	2400	Maintenance & Operation Salaries	
	2500	Food Service	
	2600	Transportation Salaries	
	2900	Noon Supervisors	
2000		TOTAL CLASSIFIED SALARIES	7,969.19
	3100	Retirement Annuity Fund (STRS)	
	3200	Classified Retirement (PERS)	
	3300	OASDHI	
	3400	Health & Welfare Benefits	
	3500	State Unemployment Insurance	
	3600	Workmen's Compensation	
	3900	Other Benefits	
3000		TOTAL EMPLOYEE BENEFITS	--
	4100	Supplementary Textbooks	
	4200	Other Books	
	4300	Instructional Supplies	4,058.19
	4400	Instructional Media Materials and Supplies	
	4500	Other Supplies	
	4600	Transportation Supplies	1,216.08
	4700	Food Services	
	4800	Equipment Replacement	
4000		TOTAL BOOKS, SUPPLIES AND EQUIPMENT REPLACEMENT	5,274.27

Table C-7 (Concluded)

	5100	Contracts for Personal Services	
	5200	Travel & Conferences	52.34
	5300	Dues & Memberships	
	5400	Insurance	
	5500	Utilities	
	5600	Leases	
	5700	Legal Audit & Election	
	5800	Other Services & Expenses	
5000		TOTAL CONTRACTED SERVICES	52.34
	6100	Sites and Improvements of Sites	
	6200	Buildings and Improvements of Buildings	
	6300	Books/Media for New or Expanded Libraries	
	6400	Equipment	
6000		TOTAL CAPITAL OUTLAY	195.04
	7100	Debt Service	
	7200	Outgoing Tuition	
	7300	Interfund Transfers	
	7400	Other Transfers	
	7900	Contingency	
7000		TOTAL ALL OTHER OUTGO	--
TOTAL EXPENDITURES			56,758.39

Table C-8

COMPUTATION OF SUMMER SCHOOL COSTS

Source(s) of Information:

	1100	Teacher's Salaries	94,845.65
	1200	School Administration Salary	7,184.74
	1300	Supervisors' Salaries	
	1400	Media Salaries	
	1500	Guidance Salaries	
	1600	Health Services	
	1700	Administration	
1000		TOTAL CERTIFICATED SALARIES	102,030.40
	2100	Teacher Aide Salaries	111.20
	2200	Management Salaries	
	2300	Clerical Salaries	1,820.79
	2400	Maintenance & Operation Salaries	
	2500	Food Service	
	2600	Transportation Salaries	
	2900	Noon Supervisors	
2000		TOTAL CLASSIFIED SALARIES	1,931.99
	3100	Retirement Annuity Fund (STRS)	
	3200	Classified Retirement (PERS)	
	3300	OASDHI	
	3400	Health & Welfare Benefits	
	3500	State Unemployment Insurance	
	3600	Workmen's Compensation	
	3900	Other Benefits	
3000		TOTAL EMPLOYEE BENEFITS	--
	4100	Supplementary Textbooks	
	4200	Other Books	
	4300	Instructional Supplies	6,724.43
	4400	Instructional Media Materials and Supplies	
	4500	Other Supplies	
	4600	Transportation Supplies	24,184.51
	4700	Food Services	
	4800	Equipment Replacement	
4000		TOTAL BOOKS, SUPPLIES AND EQUIPMENT REPLACEMENT	30,908.94

Table C-8 (Concluded)

	5100	Contracts for Personal Services	
	5200	Travel & Conferences	
	5300	Dues & Memberships	
	5400	Insurance	
	5500	Utilities	
	5600	Leases	10,858.00
	5700	Legal Audit & Election	
	5800	Other Services & Expenses	
5000		TOTAL CONTRACTED SERVICES	10,858.0
	6100	Sites and Improvements of Sites	
	6200	Buildings and Improvements of Buildings	
	6300	Books/Media for New or Expanded Libraries	
	6400	Equipment	
6000		TOTAL CAPITAL OUTLAY	
	7100	Debt Service	
	7200	Outgoing Tuition	
	7300	Interfund Transfers	
	7400	Other Transfers	
	7900	Contingency	
7000		TOTAL ALL OTHER OUTGO	145,729.33
TOTAL EXPENDITURES			

Table C-9

COMPUTATION OF YRS COSTS

Source(s) of Information:

	1100	Teacher's Salaries	103,963.80	
	1200	School Administration Salary	14,113.85	
	1300	Supervisors' Salaries		
	1400	Media Salaries		
	1500	Guidance Salaries		
	1600	Health Services	11,570.00	
	1700	Administration		
1000		TOTAL CERTIFICATED SALARIES		129,648
	2100	Teacher Aide Salaries		
	2200	Management Salaries		
	2300	Clerical Salaries	15,888	
	2400	Maintenance & Operation Salaries		
	2500	Food Service		
	2600	Transportation Salaries	12,978.82	
	2900	Noon Supervisors		
2000		TOTAL CLASSIFIED SALARIES		28,867
	3100	Retirement Annuity Fund (STRS)	1,688.40	
	3200	Classified Retirement (PERS)	1,594.30	
	3300	OASDHI	6,459.89	
	3400	Health & Welfare Benefits	4,817.28	
	3500	State Unemployment Insurance	237.94	
	3600	Workmen's Compensation	1,300.84	
	3900	Other Benefits		
3000		TOTAL EMPLOYEE BENEFITS		10,521
	4100	Supplementary Textbooks		
	4200	Other Books		
	4300	Instructional Supplies		
	4400	Instructional Media Materials and Supplies		
	4500	Other Supplies		
	4600	Transportation Supplies	12,042	
	4700	Food Services		
	4800	Equipment Replacement		
4000		TOTAL BOOKS, SUPPLIES AND EQUIPMENT REPLACEMENT		12,042

Table C-9 (Concluded)

	5100	Contracts for Personal Services		
	5200	Travel & Conferences		
	5300	Dues & Memberships		
	5400	Insurance		
	5500	Utilities	47,643.49	
	5600	Leases		
	5700	Legal Audit & Election		
	5800	Other Services & Expenses		
5000		TOTAL CONTRACTED SERVICES		47,643
	6100	Sites and Improvements of Sites		
	6200	Buildings and Improvements of Buildings		
	6300	Books/Media for New or Expanded Libraries		
	6400	Equipment		
6000		TOTAL CAPITAL OUTLAY		0
	7100	Debt Service		
	7200	Outgoing Tuition		
	7300	Interfund Transfers		
	7400	Other Transfers		
	7900	Contingency		
7000		TOTAL ALL OTHER OUTGO		0
TOTAL EXPENDITURES				228,721

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Table C-10

COMPUTATION OF ADDITIONAL COSTS

Source(s) of Information:

	1100	Teacher's Salaries	124,039.52	
	1200	School Administration Salary	21,216.00	
	1300	Supervisors' Salaries		
	1400	Media Salaries		
	1500	Guidance Salaries		
	1600	Health Services		
	1700	Administration		
1000		TOTAL CERTIFICATED SALARIES		145,256
	2100	Teacher Aide Salaries		
	2200	Management Salaries		
	2300	Clerical Salaries		
	2400	Maintenance & Operation Salaries	8,047.61	
	2500	Food Service	10,045.00	
	2600	Transportation Salaries		
	2900	Noon Supervisors		
2000		TOTAL CLASSIFIED SALARIES		18,093
	3100	Retirement Annuity Fund (STRS)	8,134.33	
	3200	Classified Retirement (PERS)	1,380.48	
	3300	OASDHI	1,016.81	
	3400	Health & Welfare Benefits	9,154.47	
	3500	State Unemployment Insurance	217.12	
	3600	Workmen's Compensation	1,453.83	
	3900	Other Benefits		
3000		TOTAL EMPLOYEE BENEFITS		21,357
	4100	Supplementary Textbooks		
	4200	Other Books		
	4300	Instructional Supplies		
	4400	Instructional Media Materials and Supplies		
	4500	Other Supplies		
	4600	Transportation Supplies		
	4700	Food Services		
	4800	Equipment Replacement		
4000		TOTAL BOOKS, SUPPLIES AND EQUIPMENT REPLACEMENT		0

Table C-10 (Concluded)

	5100	Contracts for Personal Services		
	5200	Travel & Conferences		
	5300	Dues & Memberships		
	5400	Insurance	5,612	
	5500	Utilities	51,796	
	5600	Leases		
	5700	Legal Audit & Election		
	5800	Other Services & Expenses		
5000		TOTAL CONTRACTED SERVICES		57,408
	6100	Sites and Improvements of Sites		
	6200	Buildings and Improvements of Buildings		
	6300	Books/Media for New or Expanded Libraries		
	6400	Equipment		
6000		TOTAL CAPITAL OUTLAY		0
	7100	Debt Service		
	7200	Outgoing Tuition		
	7300	Interfund Transfers		
	7400	Other Transfers		
	7900	Contingency		
7000		TOTAL ALL OTHER OUTGO		0
TOTAL EXPENDITURES				242,114

Table C-11

COMPUTATION OF SUMMER SESSION COSTS (ESTIMATED)

Source(s) of Information:

	1100	Teacher's Salaries	
	1200	School Administration Salary	
	1300	Supervisors' Salaries	
	1400	Media Salaries	
	1500	Guidance Salaries	
	1600	Health Services	
	1700	Administration	
1000		TOTAL CERTIFICATED SALARIES	145,258.69
	2100	Teacher Aide Salaries	
	2200	Management Salaries	
	2300	Clerical Salaries	
	2400	Maintenance & Operation Salaries	
	2500	Food Service	
	2600	Transportation Salaries	
	2900	Noon Supervisors	
2000		TOTAL CLASSIFIED SALARIES	2,750.78
	3100	Retirement Annuity Fund (STRS)	
	3200	Classified Retirement (PERS)	
	3300	OASDHI	
	3400	Health & Welfare Benefits	
	3500	State Unemployment Insurance	
	3600	Workmen's Compensation	
	3900	Other Benefits	
3000		TOTAL EMPLOYEE BENEFITS	
	4100	Supplementary Textbooks	
	4200	Other Books	
	4300	Instructional Supplies	
	4400	Instructional Media Materials and Supplies	
	4500	Other Supplies	
	4600	Transportation Supplies	
	4700	Food Services	
	4800	Equipment Replacement	
4000		TOTAL BOOKS, SUPPLIES AND EQUIPMENT REPLACEMENT	44,005.17

Table C-11 (Concluded)

	5100	Contracts for Personal Services	
	5200	Travel & Conferences	
	5300	Dues & Memberships	
	5400	Insurance	
	5500	Utilities	
	5600	Leases	
	5700	Legal Audit & Election	
	5800	Other Services & Expenses	
5000		TOTAL CONTRACTED SERVICES	15,459.10
	6100	Sites and Improvements of Sites	
	6200	Buildings and Improvements of Buildings	
	6300	Books/Media for New or Expanded Libraries	
	6400	Equipment	
6000		TOTAL CAPITAL OUTLAY	
	7100	Debt Service	
	7200	Outgoing Tuition	
	7300	Interfund Transfers	
	7400	Other Transfers	
	7900	Contingency	
7000		TOTAL ALL OTHER OUTGO	
TOTAL EXPENDITURES			207,473.74

Appendix D

COMPUTER PROGRAM FOR SENSITIVITY ANALYSIS

This program is written in ALGOL for the Burroughs B6700 computer. This version accepts input from a remote terminal; a companion program reads input from cards.

The program has five sections. We identify each by referring to line numbers; these are the sequence numbers at the far left (100-34300).

(1) Declarations (100-4600): In this section, the files, variables, arrays, and labels are declared for use in the body of the program.

(2) Initialization (4700-10900): Here the starting values are input for each of the policy, background, and construction variables. (In the program that reads input from cards these values come from the cards.)

(3) Compare Costs at Basic Enrollment (11000-12500): Unique costs are computed for the year-round and traditional schedules (capital, operating, and transition costs). These are compared.

(4) Sensitivity Analysis at Basic Enrollment (12600-21000): Background and policy variables are varied to determine which dominate the cost comparison at the basic enrollment.

(5) Compute Break Point (21100-25300): We vary the enrollment to determine the first enrollment level where the year-round program saves money.

(6) Sensitivity Analysis at Break-Point Enrollment (25310-34300): Background and policy variables are varied to determine which dominate the cost comparison at the break-point enrollment level.

```
  100    BEGIN  %%%%%  COMPUTE YRS V. TCS & SENSITIVITY  %%%%%                    00000100
  200                                                                            00000200
  300        FILE TEL( KIND=REMOTE, MYUSE=IO );                                  00000300
  400             LP ( KIND=PRINTER));                                           00000400
  500                                                                            00000500
  600        REAL                                                                00000600
  700             I,J,K,L,M,     %% JUNK CELLS                                   00000700
  800               %% BACKGROUND VARIABLES                                      00000800
  900             POPN,       %% POPULATION                                      00000900
 1000             CLASSES,    %% CLASSROOMS AVAILABLE                           00001000
 1100             CLASSCOST,  %% COST OF ADDING ONE CLASSROOM                   00001100
 1200             TCSUTILITIES,%% ANNUAL UTILITIES UNDER TCS                    00001200
 1300             YRSUTILITIES,%% ANNUAL UTILITIES UNDER YRS                    00001300
 1400             UTILCLASS,  %% COST OF UTILITIES FOR ONE CLASSROOM            00001400
 1500             TCSWAGES,   %% TEACHER WAGES UNDER TCS                        00001500
 1600             YRSWAGES,   %% TEACHER WAGES UNDER YRS                        00001600
 1610             TCSNWAGES,  %% NON-TEACHER WAGES UNDER TCS                    00001610
 1620             YRSNWAGES,  %% NON-TEACHER WAGES UNDER YRS                    00001620
 1700             TCSBUS,     %% BUS COSTS UNDER TCS                          00001700
 1800             YRSBUS,     %% BUS COSTS UNDER YRS                          00001800
 1850             TRANSCOST,  %% TRANSITION COST                                00001850
 1900               %% NOTE THAT CLASSCOST IS COMPUTED                          00001900
 2000                                                                           00002000
 2100               %% POLICY VARIABLES %%                                      00002100
 2200             STAFFR,     %% STAFFING RATIO                                00002200
 2300             CLASSOTHER,%% CLASSROOMS ASSIGNED TO OTHER USE                00002300
 2400             CONTRACT,   %% STANDARD CONTRACT LENGTH                       00002400
 2500             DAYS,       %% TOTAL DAYS IN SESSION UNDER YRS              00002500
 2600             EXTCONTRACT,%% WHETHER OR NOT EXTEND CONTRACTS ( 1=YES )      00002600
 2700             %% TRANSPORTATION POLICY                                      00002700
 2800             %% BUS CAPACITY                                               00002800
 2900                                                                           00002900
 3000               %% OTHER CELLS                                              00003000
 3100             SQFOOT,     %% SQUARE FEET PER CLASSROOM                     00003100
 3200             COSTPERSQ,  %% COST PER SQUARE FOOT                          00003200
 3300             BONDRATE,   %% INTEREST RATE                                 00003300
 3350             BONDRINTEGER,%INTEREST RATE IN INTEGER FORM                   00003350
 3400             BONDLENGTH,%% BOND LIFE                                       00003400
 3500                                                                           00003500
 3600             SAVING,     %% SAVING FROM YRS                               00003600
 3700             INC,        %% INCREMENT                                     00003700
 3710             BASESAVING,%% SAVINGS FROM STARTING ENROLLMENT                00003710
 3720             MINPOPN,    %% POPN * .5                                     00003720
 3730             MAXPOPN,    %% POPN * 1.5                                    00003730
 3740             TCSCOST,    %% TOTAL TCS COST                                00003740
 3750             YRSCOST,    %% TOTAL YRSCOST                                 00003750
 3760             PRINT);     %% WHETHER OR NOT TO PRINT YRS V. TCS            00003760
 3770                                                                           00003770
 3780                                                                           00003780
 3790                                                                           00003790
 3800                                                                           00003800
 3900                                                                           00003900
 4000        ARRAY A,B,C,DE 0:15 );   %% ARRAYS USED IN THE SENSITIVITY ANALYSIS 00004000
 4100                                                                           00004100
 4200        LABEL START;                                                       00004200
 4300                                                                           00004300
 4400        VALUE ARRAY NAMES (0,"UNUSED","CLASSR","UTILIT","UCLASS",          00004400
 4500          "WAGES ","NWAGES","BUS & ","TRANSR","STAFFR","SQFOOT",           00004500
```

```
4600          "$ SOFT",,"BOND $",,"BOND L"))                                                    00004600
4700                                                                                            00004700
4710                                                                                            00004710
4720     WRITE(TEL[STOP],,<"PRINT TCS V. YRS ? (YES=1)...">))                                   00004720
4730     READ (TEL, /, PRINT))                                                                  00004730
4740                                                                                            00004740
4750                                                                                            00004750
4760                                                                                            00004760
4770                                                                                            00004770
4780                                                                                            00004780
4790                                                                                            00004790
4800     START:  $$$$$ BRANCH HERE TO START OVER                                                00004800
4900                                                                                            00004900
5000     $$ BEGIN PROGRAM  $$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$   00005000
5100                                                                                            00005100
5200     WRITE(TEL,,<"***** BACKGROUND VARIABLES *****">))                                      00005200
5300     WRITE(TEL[STOP],,<"STUDENT POPULATION..">))                                            00005300
5400     READ( TEL,/,POPN ))                                                                    00005400
5500                                                                                            00005500
5600     WRITE(TEL[STOP],,<"TOTAL CLASSROOMS..">))                                              00005600
5700     READ (TEL,/,CLASSES))                                                                  00005700
5800                                                                                            00005800
5900     $$ CLASS COST IS COMPUTED BELOW AT!                                                    00005900
6000                                                                                            00006000
6100     WRITE(TEL[STOP],,<"UTILITIES !! TCS, YRS !!">))                                        00006100
6200     READ (TEL,/,TCSUTILITIES,YRSUTILITIES))                                                00006200
6300                                                                                            00006300
6400     WRITE(TEL[STOP],,<"UTILITIES COST PER CLASS..">))                                      00006400
6500     READ (TEL,/,UTILCLASS))                                                                00006500
6600                                                                                            00006600
6700     WRITE(TEL[STOP],,<"WAGES !! TCS,YRS !!">))                                             00006700
6800     READ( TEL,/,TCSWAGES,YRSWAGES))                                                        00006800
6810     WRITE(TEL[STOP],,<"NON-TEACHER WAGES !! TCS,YRS !!">))                                 00006810
6820     READ (TEL,/,TCSNWAGES,YRSNWAGES))                                                      00006820
6900                                                                                            00006900
7000     WRITE(TEL[STOP],,<"BUS COSTS !! TCS, YRS !!">))                                        00007000
7100     READ (TEL,/,TCSBUS,YRSBUS))                                                            00007100
7200                                                                                            00007200
7210     WRITE(TEL[STOP],,<"TRANSITION COSTS..">))                                              00007210
7220     READ (TEL,/,TRANSCOST))                                                                00007220
7300                                                                                            00007300
7400                                                                                            00007400
7500     WRITE(TEL,,<"***** POLICY VARIABLES *****">))                                          00007500
7600     WRITE(TEL[STOP],,<"STAFFING RATIO..">))                                                00007600
7700     READ( TEL,/,STAFFR ))                                                                  00007700
7800                                                                                            00007800
7900     WRITE(TEL[STOP],,<"CLASSROOMS NOT USED..">))                                           00007900
8000     READ (TEL,/,CLASSOTHER))                                                               00008000
8100                                                                                            00008100
8200     $$ WRITE(TEL[STOP],,<"STANDARD CONTRACT LENGTH..">))                                   00008200
8300     $$ READ (TEL,/,CONTRACT))                                                              00008300
8400                                                                                            00008400
8500     $$ WRITE(TEL[STOP],,<"TOTAL DAYS SCHOOL IN USE..">))                                   00008500
8600     $$ READ (TEL,/,DAYS))                                                                  00008600
8700                                                                                            00008700
8800     $$ WRITE(TEL[STOP],,<"CONTRACT EXTENSIONS? (YES=1)..">))                               00008800
8900     $$ READ (TEL,/,EXTCONTRACT))                                                           00008900
9000                                                                                            00009000
9100                                                                                            00009100
9200                                                                                            00009200
9300                                                                                            00009300
```

```
9400
9500    %% AT THIS POINT WE HAVE OUR DATA AND WANT TO DO THE BASIC COMPARISON
9600    WRITE(TEL,<"***** CLASSROOM CONSTRUCTION VARIABLES *****">);
9700    %% GET CLASSROOM FINANCE DATA
9800    WRITE(TEL[STOP],<"SW.FOOTAGE AVERAGE CLASSROOM..">);
9900    READ (TEL,/,SQFOOT);
10000
10100   WRITE(TEL[STOP],<"CLASSROOM COST PER SQ.FT...">);
10200   READ (TEL,/,COSTPERSQ);
10300
10400   WRITE(TEL[STOP],<"BOND LIFE..">);
10500   READ (TEL,/,BONDLENGTH);
10600
10700   WRITE(TEL[STOP],<"BOND RATE (INTEGER %) =">);
10800   READ (TEL,/,BONDRINTEGER);
10850   BONDRATE := BONDRINTEGER/100;
10900
11000   I := POPN - (STAFFR *(CLASSES-CLASSOTHER));
11100     %% THIS IS THE ENROLLMENT WITHOUT CLASSES UNDER TCS
11200   J := INTEGER( (I/STAFFR) );
11300     %% NUMBER OF NEW CLASSES NEEDED
11400   K := (COSTPERSQ * SQFOOT) * J *
11500        ( (BONDRATE*((1+BONDRATE)**BONDLENGTH)) /
11600          (((1+BONDRATE)**BONDLENGTH)-1)          );
11650   CLASSCOST:= K / J;
11700
11710   TRANSCOST := TRANSCOST *
11720                ( (BONDRATE*((1+BONDRATE)**BONDLENGTH)) /
11730                  (((1+BONDRATE)**BONDLENGTH)-1)          );
11740
11800   %% COMPUTE TOTAL YRS SAVING
11900   SAVING := K %% YEARLY CONSTRUCTION SAVING
12000           + (TCSUTILITIES*(JOUTILCLASS)- YRSUTILITIES)
12100           + (TCSWAGES      - YRSWAGES)
12150           + (TCSNWAGES     - YRSNWAGES)
12200           + (TCSBUS        - YRSBUS  )
12300            - TRANSCOST
12400            ;
12450    BASESAVING := SAVING;
12500   WRITE(TEL,</"SAVINGS =$"R11.2/>,SAVING);
12600
12700   %% NOW HAVE FINISHED BASIC COMPARISON
12800
12900
13000   %% NOW THE SENSITIVITY ANALYSIS BEGINS
13100
13200   A[0] := 13;
13300   A[1] := CLASSOTHER;
13400   A[2] := CLASSCOST;
13500   A[3] := TCSUTILITIES;
13600   A[4] := UTILCLASS;
13700   A[5] := TCSWAGES;
13800   A[6] := TCSNWAGES;
13900   A[7] := TCSBUS;
14000   A[8] := TRANSCOST;
14100
14200   FOR I := 1 STEP 1 UNTIL 8 DO
14300   BEGIN  %% BASIC VARIABLE LOOP
14400
14500       REPLACE P BY POINTER(A) FOR A[0]+1 WORDS;
14600       INC := 0;
```

```
14700
14800       DO
14900       BEGIN  %% INCREMENT EACH VARIABLE IN TURN
15000            B[I] := INTEGER(A[I]+A[I]*INC);
15100
15200            SAVING := B[2] +  %% CLASSCOST
15210                    (J:=INTEGER((POPN*(STAFFR*(CLASSES*B[1])))/STAFFR))
15300                    + (B[3]+(J*B[4]))*YRSUTILITIES)
15500                   +(B[5] * YRSWAGES)
15600                   +(B[6] * YRSNWAGES)
15700                   +(B[7] * YRSBUS)
15800                   - B[8];
15900
16000            IF SAVING > 0 THEN INC:=INC+.05;
16100
16200       END UNTIL SAVING<0 OR INC > 5;
16300
16400       C[I] := INC;
16500
16600  END;
16700
16800  A[9] := STAFFR;
16900  A[10]:= SQFOOT;
17000  A[11]:= COSTPERSQ;
17100  A[12]:= BONDRINTEGER;
17200  A[13]:= BONDLENGTH;
17300
17400  FOR I := 9 STEP 1 UNTIL A[0] DO
17500  BEGIN  %% LOOK AT POLICY VARIABLES
17600
17700       REPLACE B BY POINTER(A) FOR A[0]+1 WORDS;
17800       INC := 0;
17900
18000       DO
18100       BEGIN
18200         %% INCREMENT EACH VARIABLE IN TURN
18300            IF I=9 OR I=13 THEN
18310              B[I] := INTEGER(A[I] + A[I]*INC )
18320            ELSE  %% NEGATIVE INCREMENTS
18330              B[I] := INTEGER(A[I] - A[I]*INC );
18340
18350            BONDRATE:=B[12]/100;
18400
18500            J := POPN - (B[9] *(CLASSES-CLASSOTHER));
18600            K := INTEGER( (J/B[9]) );
18700            L := (B[10] + B[11]) * K *
18800               ( (BONDRATE*((1+BONDRATE)**B[13])) /
18900                 MAX((B**(-51)),(((1+BONDRATE)**B[13])-1))     );
19000
19100            SAVING := L  %% YEARLY CONSTRUCTION
19200                    + (TCSUTILITIES*(K*UTILCLASS)*YRSUTILITIES)
19300                    + (TCSWAGES * YRSWAGES)
19400                    + (TCSNWAGES* YRSNWAGES)
19500                    + (TCSBUS   * YRSBUS)
19600                    -  TRANSCOST;
19700
19800            IF SAVING > 0 THEN INC:=INC+.05;
19900
20000       END UNTIL SAVING<0 OR INC>5;
20100
20200       C[I] := INC;
```

```
20300
20400     END;                                                                  00020300
20500                                                                           00020400
20600     FOR I := 1 STEP 1 UNTIL A[0] DO                                       00020500
20700     BEGIN                                                                 00020600
20800         WRITE(TEL,<<A6" = "R6.2>,NAMES[I],C[I]);                          00020700
20900                                                                           00020800
21000     END;                                                                  00020900
21100                                                                           00021000
21200     $$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$ 00021100
21300     % NOW THE MARGINAL COST ANALYSIS BEGINS                             % 00021200
21400     $$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$ 00021300
21500     BONDRATE := BONDRINTEGER / 100;                                       00021400
21600     MINPOPN := (POPN*.5)DIV STAFFR * STAFFR;                              00021500
21610     MAXPOPN := (POPN*1.5)DIV STAFFR * STAFFR;                             00021600
21620                                                                           00021610
21700     POPN := MINPOPN;                                                      00021620
21800                                                                           00021700
21900     DO                                                                    00021800
22000     BEGIN  $$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$ 00021900
22100                                                                           00022000
22200     I := POPN - (STAFFR *(CLASSES-CLASSOTHER));                           00022100
22300       %% THIS IS THE ENROLLMENT WITHOUT CLASSES UNDER TCS                  00022200
22400     J := INTEGER( (I/STAFFR) );                                           00022300
22500       %% NUMBER OF NEW CLASSES NEEDED                                    00022400
22600     K := (COSTPERSQ * SQFOOT) * J *                                       00022500
22700          ( (BONDRATE*((1+BONDRATE)**BONDLENGTH)) /                        00022600
22800            (((1+BONDRATE)**BONDLENGTH)-1)          );                    00022700
22900          IF J LEQ 0 THEN CLASSCOST:=0 ELSE CLASSCOST:=K/J;                00022800
22950          IF I<0 THEN I:=J:=K:=0;                                          00022900
23000                                                                           00022950
23100          TCSCOST := K + (TCSUTILITIES*(J*UTILCLASS)) + TCSWAGES           00023000
23200                      + TCSNWAGES + TCSBUS;                                00023100
23300          YRSCOST := YRSUTILITIES + YRSWAGES + YRSNWAGES + YRSBUS          00023200
23400                      + TRANSCOST;                                         00023300
23500          SAVING := TCSCOST - YRSCOST;                                     00023400
23600          IF BOOLEAN(PRINT) THEN                                           00023500
23700            WRITE( TEL, <"POPN = "I5" TCS = "R11.2" YRS = "R11.2>,         00023600
23800                        POPN,TCSCOST,YRSCOST );                            00023700
23900                                                                           00023800
24000                                                                           00023900
24100                                                                           00024000
24200                                                                           00024100
24300                                                                           00024200
24400     IF SAVING < 0 THEN POPN := J + STAFFR;                                00024300
24500                                                                           00024400
24600     END    $$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$ 00024500
24700     UNTIL SAVING GEQ 0 OR POPN GEQ MAXPOPN;                               00024600
24800                                                                           00024700
24900     WRITE( TEL,</"BREAK POINT = "I4>,POPN );                              00024800
25000     WRITE( TEL,<"SAVINGS =$"R11.2/>,SAVING);                              00024900
25010     IF BOOLEAN(PRINT) AND POPN < MAXPOPN THEN                             00025000
25020     BEGIN                                                                 00025010
25030         L:=POPN;                                                          00025020
25035         POPN:=J:=STAFFR;                                                  00025030
25040         DO                                                                00025035
25050         BEGIN  $$$$$                                                      00025040
25060         I := POPN - (STAFFR *(CLASSES-CLASSOTHER));                       00025050
25070       %% THIS IS THE ENROLLMENT WITHOUT CLASSES UNDER TCS                  00025060
25080         J := INTEGER( (I/STAFFR) );                                       00025070
25090       %% NUMBER OF NEW CLASSES NEEDED                                    00025080
                                                                              00025090
```

```
25100         K := (COSTPERSG * SGFOOT) * J *                                    00025100
25110          ( (BONDRATE*((1+BONDRATE)**BONDLENGTH)) /                         00025110
25120            (((1+BONDRATE)**BONDLENGTH)-1)          ));                     00025120
25130         IF I<U THEN I:=J:=K:=0;                                            00025130
25140                                                                            00025140
25150         TCSCOST := K + (TCSUTILITIES*(J+UTILCLASS)) + TCSWAGES             00025150
25160                     + TCSNWAGES + TCSBUS;                                  00025160
25170         YRSCOST := YRSUTILITIES + YRSWAGES + YRSNWAGES + YRSBUS            00025170
25180                     + TRANSCOST;                                           00025180
25190         SAVING := TCSCOST - YRSCOST;                                       00025190
25200                                                                            00025200
25210         WRITE( TEL, <"PUPN = "I5" TCS = "R11.2" YRS = "R11.2>>             00025210
25220                     PUPN,TCSCOST,YRSCOST );                                00025220
25230         PUPN := + + STAFFR;                                                00025230
25240                                                                            00025240
25250         END 33333                                                          00025250
25260         UNTIL PUPN GEQ MAXPOPN;                                            00025260
25270                                                                            00025270
25280         PUPN := L;                                                         00025280
25290                                                                            00025290
25300     END;  %% PRINT LOOP                                                    00025300
25310                                                                            00025310
25320                                                                            00025320
25330                                                                            00025330
25340                                                                            00025340
25350     %% NOW REDO SENSITIVITY ANALYSIS AT THIS POPULATION                    00025350
25360                                                                            00025360
25400     A[0] := 13;                                                            00025400
25500     A[1] := CLASSOTHER;                                                    00025500
25600     A[2] := CLASSCOST;                                                     00025600
25700     A[3] := TCSUTILITIES;                                                  00025700
25800     A[4] := UTILCLASS;                                                     00025800
25900     A[5] := TCSWAGES;                                                      00025900
26000     A[6] := TCSNWAGES;                                                     00026000
26100     A[7] := TCSBUS;                                                        00026100
26200     A[8] := TRANSCOST;                                                     00026200
26300                                                                            00026300
26400     FOR I := 1 STEP 1 UNTIL 8 DO                                           00026400
26500     BEGIN  %% BASIC VARIABLE LOOP                                          00026500
26600                                                                            00026600
26700         REPLACE B BY POINTER(A) FOR A[0]+1 WORDS;                          00026700
26800         INC := 0;                                                          00026800
26900                                                                            00026900
27000         DO                                                                 00027000
27100         BEGIN  %% INCREMENT EACH VARIABLE IN TURN                          00027100
27200              B[I] := INTEGER(A[I]:=A[I]+INC);                              00027200
27300                                                                            00027300
27400              SAVING := B[2] +  %% CLASSCOST                                00027400
27500                      (J:=INTEGER((PUPN*(STAFFR+(CLASSES*B[1])))/STAFFR))   00027500
27600                      + (B[3]+(J*B[4]))-YRSUTILITIES)                       00027600
27700                     +(B[5] - YRSWAGES)                                     00027700
27800                     +(B[6] - YRSNWAGES)                                    00027800
27900                     +(B[7] - YRSBUS)                                       00027900
28000                     - B[8]);                                               00028000
28100                                                                            00028100
28200              IF SAVING > 0 THEN INC:=***.05;                               00028200
28300                                                                            00028300
28400         END UNTIL SAVING<0 OR INC > 5;                                     00028400
28500                                                                            00028500
28600         C[I] := INC;                                                       00028600
28700                                                                            00028700
```

```
28800    END;                                                                    00028800
28900                                                                            00028900
29000    A[9] := STAFFR;                                                         00029000
29100    A[10]:= SQFOOT;                                                         00029100
29200    A[11]:= CUSTPERSQ;                                                      00029200
29300    A[12]:= HUNDRINTEGER;                                                   00029300
29400    A[13]:= BONDLENGTH;                                                     00029400
29500                                                                            00029500
29600    FOR I := 9 STEP 1 UNTIL A[0] DO                                         00029600
29700    BEGIN  %% LOOK AT POLICY VARIABLES                                      00029700
29800                                                                            00029800
29900        REPLACE P BY POINTER(A) FOR A[0]+1 WORDS;                           00029900
30000        INC := 0;                                                           00030000
30100                                                                            00030100
30200        DO                                                                  00030200
30300        BEGIN                                                               00030300
30400          %% INCREMENT EACH VARIABLE IN TURN                                00030400
30500              IF I=9 OR I=13 THEN                                           00030500
30600                B[I] := INTEGER(A[I] + A[I]*INC )                           00030600
30700              ELSE  %% NEGATIVE INCREMENTS                                  00030700
30800                B[I] := INTEGER(A[I] - A[I]*INC );                          00030800
30900                                                                            00030900
31000              BONDRATE:=B[12]/100;                                          00031000
31100                                                                            00031100
31200              J := POPN - (B[9] *(CLASSES-CLASSOTHER));                     00031200
31300              K := INTEGER( (J/B[9]) );                                     00031300
31400              L := (B[10] * B[11]) * K *                                    00031400
31500                 ( (BONDRATE*((1+BONDRATE)**B[13])) /                       00031500
31600                   MAX((B**(-51)),(((1+BONDRATE)**B[13])-1))      );         00031600
31700                                                                            00031700
31800              SAVING := L  %% YEARLY CONSTRUCTION                           00031800
31900                     + (TCSUTILITIES*(K*UTILCLASS)-YRSUTILITIES)            00031900
32000                     + (TCSWAGES - YRSWAGES)                                00032000
32100                     + (TCSNWAGES- YRSNWAGES)                               00032100
32200                     + (TCSBUS   - YRSBUS)                                  00032200
32300                     -  TRANSCUST;                                          00032300
32400                                                                            00032400
32500              IF SAVING > 0 THEN INC:=*+.05;                                00032500
32600                                                                            00032600
32700        END UNTIL SAVING<0 OR INC>5;                                        00032700
32800                                                                            00032800
32900        C[I] := INC;                                                        00032900
33000                                                                            00033000
33100    END;                                                                    00033100
33200                                                                            00033200
33300    FOR I := 1 STEP 1 UNTIL A[0] DO                                         00033300
33400    BEGIN                                                                   00033400
33500        WRITE(TEL,<A6" = "R#.2>,NAMES[I],C[I]);                             00033500
33600                                                                            00033600
33700    END;                                                                    00033700
33800                                                                            00033800
33900    WRITE( TEL[STOP], <"DO YOU WANT TO REPEAT THE ANALYSIS? (YES=1)..">);   00033900
34000    READ ( TEL, /, I );                                                     00034000
34100    IF I=1 THEN GO TO START;  %% BRANCH BACK TO THE BEGINNING               00034100
34200                                                                            00034200
34300    END.                                                                    00034300
```

Appendix E

SENSITIVITY ANALYSIS DATA FOR EACH SCHOOL

The following pages contain the input data for each school and the results of the computer session where the sensitivity analysis was performed.

The computer session has three parts:

(1) Input of Background, Policy, and Construction Variables

```
♦♦♦♦♦ BACKGROUND VARIABLES ♦♦♦♦♦
STUDENT POPULATION..  550
TOTAL CLASSROOMS..  16
UTILITIES :: TCS, YRS ::     4505.35     4961.41
UTILITIES COST PER CLASS..      282.00
WAGES :: TCS,YRS ::    87376.00    62921.00
NON-TEACHER WAGES :: TCS,YRS ::.    9352.00    10786.00
BUS COSTS :: TCS, YRS ::          0.00     5409.00
TRANSITION COSTS..     1896.00
♦♦♦♦♦ POLICY VARIABLES ♦♦♦♦♦
STAFFING RATIO..  29
CLASSROOMS NOT USED..   2
♦♦♦♦♦ CLASSROOM CONSTRUCTION VARIABLES ♦♦♦♦♦
SQ.FOOTAGE AVERAGE CLASSROOM..1595
CLASSROOM COST PER SQ.FT...       55.32
BOND LIFE.. 20
BOND RATE (INTEGER %) =  6
```

(2) Basic Enrollment

- Savings due to year-round schedule
- Relative impact of policy and background variables

```
SAVINGS =$    56864.46

UNUSED = 3.75
CLASS$ = 1.50
UTILIT = 5.00
UCLASS = 5.00
WAGES  = 0.70
NWAGES = 5.00
BUS $  = 5.00
TRANS$ = 5.00
STAFFR = 0.65
SQFOOT = 1.50
$ SQFT = 1.50
BOND % = 1.10
BOND L = 5.00
```

(3) Break-Point Enrollment

- Enrollment where first YRS savings are realized
- Savings due to year-round schedule (at this enrollment)
- Relative impact of policy and background variables

```
POPN =    261 TCS =    101233.35 YRS =     84242.71

BREAK POINT =  261
SAVINGS =$    16990.64

POPN =    290 TCS =    101233.35 YRS =     84242.71
POPN =    319 TCS =    101233.35 YRS =     84242.71
POPN =    348 TCS =    101233.35 YRS =     84242.71
POPN =    377 TCS =    101233.35 YRS =     84242.71
POPN =    406 TCS =    101233.35 YRS =     84242.71
POPN =    435 TCS =    109208.11 YRS =     84242.71
POPN =    464 TCS =    117182.88 YRS =     84242.71
POPN =    493 TCS =    125157.64 YRS =     84242.71
POPN =    522 TCS =    133132.41 YRS =     84242.71
POPN =    551 TCS =    141107.17 YRS =     84242.71
POPN =    580 TCS =    149081.94 YRS =     84242.71
POPN =    609 TCS =    157056.70 YRS =     84242.71
POPN =    638 TCS =    165031.46 YRS =     84242.71
POPN =    667 TCS =    173006.23 YRS =     84242.71
POPN =    696 TCS =    180980.99 YRS =     84242.71
POPN =    725 TCS =    188955.76 YRS =     84242.71
POPN =    754 TCS =    196930.52 YRS =     84242.71
POPN =    783 TCS =    204905.29 YRS =     84242.71
UNUSED = 5.00
CLASS$ = 5.00
UTILIT = 3.50
UCLASS = 5.00
WAGES  = 0.20
NWAGES = 1.70
BUS $  = 5.00
TRANS$ = 5.00
STAFFR = 0.00
SQFOOT = 0.00
$ SQFT = 0.00
BOND % = 0.00
BOND L = 0.00
```

SENSITIVITY ANALYSIS WORK SHEET Date 1-18-78

District PVUSD

School Ames T1

BACKGROUND VARIABLES

STUDENT POPULATION	550
TOTAL CLASSROOMS	16
UTILITIES	
YEARLY COST TCS	$4505
YEARLY COST YRS	$4961
COST PER CLASS TCS	282
TEACHER COMPENSATION	
YEARLY COST TCS	$87,376
YEARLY COST YRS	62,921
NON-TEACHER COMPENSATION	
YEARLY COST TCS	$9352
YEARLY COST YRS	10,786
TRANSPORTATION	
YEARLY COST TCS	$ 0
YEARLY COST YRS	5409
TRANSITION COST	$1876

POLICY VARIABLES

STAFFING RATIO	29
CLASSROOMS NOT USED	2

CONSTRUCTION VARIABLES

SQUARE FOOTAGE PER CLASSROOM	1595
CLASSROOM COST PER SQUARE FOOT	$55.32
BOND LIFE	20
INTEREST RATE	6%

AMESTI SCHOOL

SENSITIVITY ANALYSIS

```
◆◆◆◆◆ BACKGROUND VARIABLES ◆◆◆◆◆
STUDENT POPULATION..  550
TOTAL CLASSROOMS..  16
UTILITIES :: TCS, YRS ::     4505.35     4961.41
UTILITIES COST PER CLASS..      282.00
WAGES :: TCS,YRS ::    87376.00    62921.00
NON-TEACHER WAGES :: TCS,YRS ::     9352.00    10786.00
BUS COSTS :: TCS, YRS ::        0.00     5409.00
TRANSITION COSTS..     1896.00
◆◆◆◆◆ POLICY VARIABLES ◆◆◆◆◆
STAFFING RATIO..  29
CLASSROOMS NOT USED..   2
◆◆◆◆◆ CLASSROOM CONSTRUCTION VARIABLES ◆◆◆◆◆
SQ.FOOTAGE AVERAGE CLASSROOM..1595
CLASSROOM COST PER SQ.FT...       55.32
BOND LIFE.. 20
BOND RATE (INTEGER %) =  6

SAVINGS =$    56864.46

UNUSED = 3.75
CLASS$ = 1.50
UTILIT = 5.00
UCLASS = 5.00
WAGES  = 0.70
NWAGES = 5.00
BUS $  = 5.00
TRANS$ = 5.00
STAFFR = 0.65
SQFOOT = 1.50
$ SQFT = 1.50
BOND % = 1.10
BOND L = 5.00
```

```
POPN =    261 TCS =    101233.35 YRS =     84242.71

BREAK POINT =  261
SAVINGS =$    16990.64

POPN =    290 TCS =    101233.35 YRS =     84242.71
POPN =    319 TCS =    101233.35 YRS =     84242.71
POPN =    348 TCS =    101233.35 YRS =     84242.71
POPN =    377 TCS =    101233.35 YRS =     84242.71
POPN =    406 TCS =    101233.35 YRS =     84242.71
POPN =    435 TCS =    109208.11 YRS =     84242.71
POPN =    464 TCS =    117182.88 YRS =     84242.71
POPN =    493 TCS =    125157.64 YRS =     84242.71
POPN =    522 TCS =    133132.41 YRS =     84242.71
POPN =    551 TCS =    141107.17 YRS =     84242.71
POPN =    580 TCS =    149081.94 YRS =     84242.71
POPN =    609 TCS =    157056.70 YRS =     84242.71
POPN =    638 TCS =    165031.46 YRS =     84242.71
POPN =    667 TCS =    173006.23 YRS =     84242.71
POPN =    696 TCS =    180980.99 YRS =     84242.71
POPN =    725 TCS =    188955.76 YRS =     84242.71
POPN =    754 TCS =    196930.52 YRS =     84242.71
POPN =    783 TCS =    204905.29 YRS =     84242.71
UNUSED = 5.00
CLASS% = 5.00
UTILIT = 3.50
UCLASS = 5.00
WAGES  = 0.20
NWAGES = 1.70
BUS %  = 5.00
TRANS% = 5.00
STAFFR = 0.00
SQFOOT = 0.00
$ SQFT = 0.00
BOND % = 0.00
BOND L = 0.00
```

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SENSITIVITY ANALYSIS WORK SHEET

Date 1-10-78

District PVUSD

School CALABASAS

BACKGROUND VARIABLES

STUDENT POPULATION	450
TOTAL CLASSROOMS	12
UTILITIES	
YEARLY COST TCS	$7417
YEARLY COST YRS	8282
COST PER CLASS TCS	618
TEACHER COMPENSATION	
YEARLY COST TCS	0
YEARLY COST YRS	0
NON-TEACHER COMPENSATION	
YEARLY COST TCS	$9352
YEARLY COST YRS	7613
TRANSPORTATION	
YEARLY COST TCS	0
YEARLY COST YRS	$5409
TRANSITION COST	$1896

POLICY VARIABLES

STAFFING RATIO	29
CLASSROOMS NOT USED	0

CONSTRUCTION VARIABLES

SQUARE FOOTAGE PER CLASSROOM	1595
CLASSROOM COST PER SQUARE FOOT	$55.32
BOND LIFE	20
INTEREST RATE	6%

CALABASAS SCHOOL

SENSITIVITY ANALYSIS

```
◆◆◆◆◆ BACKGROUND VARIABLES ◆◆◆◆◆
STUDENT POPULATION..  450
TOTAL CLASSROOMS..  12
UTILITIES :: TCS, YRS ::     7416.57     8281.57
UTILITIES COST PER CLASS..      618.00
WAGES :: TCS,YRS ::         0.00        0.00
NON-TEACHER WAGES :: TCS,YRS ::     9352.00     7613.00
BUS COSTS :: TCS, YRS ::         0.00     5408.59
TRANSITION COSTS..     1896.00
◆◆◆◆◆ POLICY VARIABLES ◆◆◆◆◆
STAFFING RATIO..  29
CLASSROOMS NOT USED..   0
◆◆◆◆◆ CLASSROOM CONSTRUCTION VARIABLES ◆◆◆◆◆
SQ.FOOTAGE AVERAGE CLASSROOM..1595
CLASSROOM COST PER SQ.FT....
      55.32
BOND LIFE.. 20
BOND RATE (INTEGER %) =  6

SAVINGS =$    28543.17

UNUSED = 5.00
CLASS$ = 0.95
UTILIT = 3.85
UCLASS = 5.00
WAGES  = 5.00
NWAGES = 3.10
BUS $  = 5.00
TRANS$ = 5.00
STAFFR = 0.30
SQFOOT = 0.95
$ SQFT = 0.95
BOND % = 0.95
BOND L = 5.00
```


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```
POPN =    203 TCS =     16768.57 YRS =     21468.46
POPN =    232 TCS =     16768.57 YRS =     21468.46
POPN =    261 TCS =     16768.57 YRS =     21468.46
POPN =    290 TCS =     16768.57 YRS =     21468.46
POPN =    319 TCS =     16768.57 YRS =     21468.46
POPN =    348 TCS =     16768.57 YRS =     21468.46
POPN =    377 TCS =     25079.33 YRS =     21468.46

BREAK POINT =  377
SAVINGS =$     3610.87

POPN =    406 TCS =     33390.10 YRS =     21468.46
POPN =    435 TCS =     41700.86 YRS =     21468.46
POPN =    464 TCS =     50011.63 YRS =     21468.46
POPN =    493 TCS =     58322.39 YRS =     21468.46
POPN =    522 TCS =     66633.16 YRS =     21468.46
POPN =    551 TCS =     74943.92 YRS =     21468.46
POPN =    580 TCS =     83254.68 YRS =     21468.46
POPN =    609 TCS =     91565.45 YRS =     21468.46
POPN =    638 TCS =     99876.21 YRS =     21468.46
UNUSED = 5.00
CLASS% = 0.50
UTILIT = 0.50
UCLASS = 5.00
WAGES  = 5.00
NWAGES = 0.40
BUS %  = 5.00
TRANS% = 5.00
STAFFR = 0.10
SQFOOT = 0.50
$ SQFT = 0.50
BOND % = 0.95
BOND L = 5.00
```

SENSITIVITY ANALYSIS WORK SHEET

Date 1-18-78

District PVUSD

School Freedom

BACKGROUND VARIABLES

STUDENT POPULATION	650
TOTAL CLASSROOMS	22
UTILITIES	
YEARLY COST TCS	$10,654
YEARLY COST YRS	12,011
COST PER CLASS TCS	484
TEACHER COMPENSATION	
YEARLY COST TCS	$35,184
YEARLY COST YRS	30,090
NON-TEACHER COMPENSATION	
YEARLY COST TCS	$9352
YEARLY COST YRS	8942
TRANSPORTATION	
YEARLY COST TCS	0
YEARLY COST YRS	$ 5409
TRANSITION COST	$ 1896

POLICY VARIABLES

STAFFING RATIO	29
CLASSROOMS NOT USED	2

CONSTRUCTION VARIABLES

SQUARE FOOTAGE PER CLASSROOM	1695
CLASSROOM COST PER SQUARE FOOT	$55.32
BOND LIFE	20
INTEREST RATE	6%

FREEDOM SCHOOL

SENSITIVITY ANALYSIS

```
••••• BACKGROUND VARIABLES •••••
STUDENT POPULATION..  650
TOTAL CLASSROOMS..  22
UTILITIES :: TOS, YRS ::    10653.75    12010.52
UTILITIES COST PER CLASS..      484.00
WAGES :: TOS,YRS ::    35184.00    30090.00
NON-TEACHER WAGES :: TOS,YRS ::     9352.00     8942.00
BUS COSTS :: TOS, YRS ::        0.00     5409.00
TRANSITION COSTS..    1896.00
••••• POLICY VARIABLES •••••
STAFFING RATIO..  29
CLASSROOMS NOT USED..   2
••••• CLASSROOM CONSTRUCTION VARIABLES •••••
SQ.FOOTAGE AVERAGE CLASSROOM..1595
CLASSROOM COST PER SQ.FT...       55.32
BOND LIFE.. 20
BOND RATE (INTEGER %) =  6

SAVINGS =$    14926.46

UNUSED = 0.80
CLASS$ = 1.00
UTILIT = 1.45
UCLASS = 5.00
WAGES  = 0.45
NWAGES = 1.60
BUS $  = 5.00
TRANS$ = 5.00
STAFFR = 0.10
SQFOOT = 1.00
$ SQFT = 1.00
BOND % = 0.95
BOND L = 5.00
```

```
POPN =    319 TCS =     55189.75 YRS =     56616.82
POPN =    348 TCS =     55189.75 YRS =     56616.82
POPN =    377 TCS =     55189.75 YRS =     56616.82
POPN =    406 TCS =     55189.75 YRS =     56616.82
POPN =    435 TCS =     55189.75 YRS =     56616.82
POPN =    464 TCS =     55189.75 YRS =     56616.82
POPN =    493 TCS =     55189.75 YRS =     56616.82
POPN =    522 TCS =     55189.75 YRS =     56616.82
POPN =    551 TCS =     55189.75 YRS =     56616.82
POPN =    580 TCS =     55189.75 YRS =     56616.82
POPN =    609 TCS =     63366.51 YRS =     56616.82

BREAK POINT =  609
SAVINGS =$     6749.69

POPN =    638 TCS =     71543.28 YRS =     56616.82
POPN =    667 TCS =     79720.04 YRS =     56616.82
POPN =    696 TCS =     87896.81 YRS =     56616.82
POPN =    725 TCS =     96073.57 YRS =     56616.82
POPN =    754 TCS =    104250.34 YRS =     56616.82
POPN =    783 TCS =    112427.10 YRS =     56616.82
POPN =    812 TCS =    120603.86 YRS =     56616.82
POPN =    841 TCS =    128780.63 YRS =     56616.82
POPN =    870 TCS =    136957.39 YRS =     56616.82
POPN =    899 TCS =    145134.16 YRS =     56616.82
POPN =    928 TCS =    153310.92 YRS =     56616.82
UNUSED = 0.30
CLASS% = 0.90
UTILIT = 0.65
UCLASS = 5.00
WAGE$  = 0.20
NWAGE$ = 0.75
BUI $  = 5.00
TRANS$ = 5.00
STAFFR = 0.05
SQFOOT = 0.90
$ SQFT = 0.90
BOND % = 0.95
BOND L = 5.00
```

SENSITIVITY ANALYSIS WORK SHEET

Date 1-18-78

District PVUSD

School Hyde

BACKGROUND VARIABLES

STUDENT POPULATION	440
TOTAL CLASSROOMS	13
UTILITIES	
YEARLY COST TCS	$4934
YEARLY COST YRS	5334
COST PER CLASS TCS	380
TEACHER COMPENSATION	
YEARLY COST TCS	0
YEARLY COST YRS	$5409
NON-TEACHER COMPENSATION	
YEARLY COST TCS	$9352
YEARLY COST YRS	7332
TRANSPORTATION	
YEARLY COST TCS	0
YEARLY COST YRS	$5409
TRANSITION COST	$ 1876

POLICY VARIABLES

STAFFING RATIO	29
CLASSROOMS NOT USED	0

CONSTRUCTION VARIABLES

SQUARE FOOTAGE PER CLASSROOM	1595
CLASSROOM COST PER SQUARE FOOT	$ 55.32
BOND LIFE	20
INTEREST RATE	6%

HYDE SCHOOL

SENSITIVITY ANALYSIS

```
◆◆◆◆◆ BACKGROUND VARIABLES ◆◆◆◆◆
STUDENT POPULATION..  440
TOTAL CLASSROOMS..  13
UTILITIES :: TCS, YRS ::     4933.97     5333.51
UTILITIES COST PER CLASS..      380.00
WAGES :: TCS,YRS ::          0.00     5409.00
NON-TEACHER WAGES :: TCS,YRS ::      9352.00     7332.00
BUC COSTS :: TCS, YRS ::         0.00     5409.00
TRANSITION COSTS..     1896.00
◆◆◆◆◆ POLICY VARIABLES ◆◆◆◆◆
STAFFING RATIO..  29
CLASSROOMS NOT USED..  0
◆◆◆◆◆ CLASSROOM CONSTRUCTION VARIABLES ◆◆◆◆◆
SQ.FOOTAGE AVERAGE CLASSROOM..1595
CLASSROOM COST PER SQ.FT...       55.32
BOND LIFE.. 20
BOND RATE (INTEGER %) =  6

SAVINGS =$     6782.69

UNUSED = 5.00
CLASS$ = 0.45
UTILIT = 1.40
UCLASS = 5.00
WAGES  = 5.00
NWAGES = 0.75
BUC $  = 5.00
TRANS$ = 5.00
STAFFR = 0.10
SQFOOT = 0.45
$ SQFT = 0.45
BOND % = 0.95
BOND L = 5.00
```

```
POPN =    203 TCS =     14285.97 YRS =     23648.81
POPN =    232 TCS =     14285.97 YRS =     23648.81
POPN =    261 TCS =     14285.97 YRS =     23648.81
POPN =    290 TCS =     14285.97 YRS =     23648.81
POPN =    319 TCS =     14285.97 YRS =     23648.81
POPN =    348 TCS =     14285.97 YRS =     23648.81
POPN =    377 TCS =     14285.97 YRS =     23648.81
POPN =    406 TCS =     22358.73 YRS =     23648.81
POPN =    435 TCS =     30431.50 YRS =     23648.81

BREAK POINT =  435
SAVINGS =$     6782.69

POPN =    464 TCS =     38504.26 YRS =     23648.81
POPN =    493 TCS =     46577.03 YRS =     23648.81
POPN =    522 TCS =     54649.79 YRS =     23648.81
POPN =    551 TCS =     62722.56 YRS =     23648.81
POPN =    580 TCS =     70795.32 YRS =     23648.81
POPN =    609 TCS =     78868.08 YRS =     23648.81
UNUSED = 5.00
CLASS$ = 0.45
UTILIT = 1.40
UCLASS = 5.00
WAGES  = 5.00
NWAGES = 0.75
BUS $  = 5.00
TRANS$ = 5.00
STAFFR = 0.10
SQFOOT = 0.45
$ SQFT = 0.45
BOND % = 0.95
BOND L = 5.00
```

SENSITIVITY ANALYSIS WORK SHEET

Date 1-18-78

District PVUSD

School Rolling Hills

BACKGROUND VARIABLES

STUDENT POPULATION	540
TOTAL CLASSROOMS	19
UTILITIES	
YEARLY COST TCS	$15,660
YEARLY COST YRS	17,056
COST PER CLASS TCS	824
TEACHER COMPENSATION	
YEARLY COST TCS	$16,295
YEARLY COST YRS	14,015
NON-TEACHER COMPENSATION	
YEARLY COST TCS	$9352
YEARLY COST YRS	8803
TRANSPORTATION	
YEARLY COST TCS	0
YEARLY COST YRS	$5409
TRANSITION COST	$1896

POLICY VARIABLES

STAFFING RATIO	26
CLASSROOMS NOT USED	1

CONSTRUCTION VARIABLES

SQUARE FOOTAGE PER CLASSROOM	1950
CLASSROOM COST PER SQUARE FOOT	$56.83
BOND LIFE	20
INTEREST RATE	6%

ROLLING HILLS JUNIOR HIGH SCHOOL

SENSITIVITY ANALYSIS

```
♦♦♦♦♦ BACKGROUND VARIABLES ♦♦♦♦♦
STUDENT POPULATION..  590
TOTAL CLASSROOMS..  19
UTILITIES :: TOS, YRS ::    15660.10    17056.48
UTILITIES COST PER CLASS..      824.00
WAGES :: TOS,YRS ::    16295.00    14015.00
NON-TEACHER WAGES :: TOS,YRS ::     9352.00     8803.00
BUS COSTS :: TOS, YRS ::        0.00     5409.00
TRANSITION COSTS..     1896.00
♦♦♦♦♦ POLICY VARIABLES ♦♦♦♦♦
STAFFING RATIO..  26
CLASSROOMS NOT USED..   1
♦♦♦♦♦ CLASSROOM CONSTRUCTION VARIABLES ♦♦♦♦♦
SQ.FOOTAGE AVERAGE CLASSROOM..1950
CLASSROOM COST PER SQ.FT...       56.83
BOND LIFE.. 20
BOND RATE (INTEGER %) =  6

SAVINGS =$    48286.63

UNUSED = 4.50
CLASS$ = 1.00
UTILIT = 3.10
UCLASS = 5.00
WAGES  = 3.00
NWAGES = 5.00
BUS $  = 5.00
TRANS$ = 5.00
STAFFR = 0.25
SQFOOT = 1.00
$ SQFT = 1.00
BOND % = 0.95
BOND L = 5.00
```

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```
POPN =    286 TCS =     41307.10 YRS =     45448.78
POPN =    312 TCS =     41307.10 YRS =     45448.78
POPN =    338 TCS =     41307.10 YRS =     45448.78
POPN =    364 TCS =     41307.10 YRS =     45448.78
POPN =    390 TCS =     41307.10 YRS =     45448.78
POPN =    416 TCS =     41307.10 YRS =     45448.78
POPN =    442 TCS =     41307.10 YRS =     45448.78
POPN =    468 TCS =     41307.10 YRS =     45448.78
POPN =    494 TCS =     51792.76 YRS =     45448.78

BREAK POINT =  494
SAVINGS =$     6343.98

POPN =    520 TCS =     62278.42 YRS =     45448.78
POPN =    546 TCS =     72764.09 YRS =     45448.78
POPN =    572 TCS =     83249.75 YRS =     45448.78
POPN =    598 TCS =     93735.41 YRS =     45448.78
POPN =    624 TCS =    104221.07 YRS =     45448.78
POPN =    650 TCS =    114706.73 YRS =     45448.78
POPN =    676 TCS =    125192.39 YRS =     45448.78
POPN =    702 TCS =    135678.06 YRS =     45448.78
POPN =    728 TCS =    146163.72 YRS =     45448.78
POPN =    754 TCS =    156649.38 YRS =     45448.78
POPN =    780 TCS =    167135.04 YRS =     45448.78
POPN =    806 TCS =    177620.70 YRS =     45448.78
POPN =    832 TCS =    188106.37 YRS =     45448.78
POPN =    858 TCS =    198592.03 YRS =     45448.78
UNUSED = 0.55
CLASS$ = 0.70
UTILIT = 0.45
UCLASS = 5.00
WAGES  = 0.40
NWAGES = 0.70
RUI $  = 5.00
TRANS$ = 5.00
STAFFR = 0.05
SQFOOT = 0.70
$ SQFT = 0.70
BOND % = 0.95
BOND L = 5.00
```

Appendix F

ADDITIONAL YRS COST DATA

This appendix contains cost data from six California school districts. The results of the cost analyses are summarized in Table F-1. In all but one case, the year-round schedule results in LEA cost savings.

Table F-1

SUMMARY OF LEA SAVINGS DUE TO YRS PROGRAMS

LEA	Annual Cost of Program		Saving (Cost)
	YRS	TCS	
Berryessa	$ 12,055,071	$ 12,121,307	$ 66,236
Cabrillo	5,063,388	5,072,454	9,066
Chino	14,763,711	14,802,314	38,603
Encinitas	3,490,556	3,441,384	(49,172)
Escondido	11,969,030	12,220,467	251,437
San Diego	176,202,881	176,305,227	102,346
Total			418,516
Average			69,753

1. History and Growth of YRS Programs in California*

Year-round schooling began in California in 1965 when the Legislature authorized a 2-year experimental program to be conducted at Del Campo High School in Sacramento County. The program was concluded unsuccessfully after the third quarter of the first year because the voluntary enrollment was insufficient to support it. In 1968, special legislation enabled Hayward Unified School District to operate a year-round program. The

*This material was abstracted from Fiscal Impact of California's Year-Round School Programs, Report of the Auditor General to the Joint Legislative Audit Committee (September 1977).

Legislature subsequently broadened the definition of year-round schools and provided financial assistance to enable other districts to operate year-round programs.

Table F-2 illustrates the growth of YRS programs in California since 1968.

Table F-2

GROWTH OF YEAR-ROUND SCHOOLS IN CALIFORNIA

Fiscal Year	Number of Public School Districts Statewide	Number of School Districts With YRS Programs	Number of Public Schools Statewide*	Number of Schools With YRS Programs
1968-69	1,094	1	6,859	1
1969-70	1,082	1	6,884	1
1970-71	1,070	1	6,931	1
1971-72	1,067	4	6,981	9
1972-73	1,067	16	7,019	48
1973-74	1,054	30	7,037	100
1974-75	1,048	38	7,076	127
1975-76	1,046	45	7,045	159
1976-77	1,042	56	7,035	200

*This figure does not include schools reported under county office administration or special schools.

In a statewide survey to determine why schools have implemented YRS programs, the most frequently mentioned reasons are:

Reason for Implementing YRS Programs	Mentioned as Most Important	Mentioned as Less Important
Increase classroom capacity	120	8
Provide educational advantage	39	52
Reduce learning loss	20	27
Provide additional programs	0	16
Increase flexibility	7	43
Miscellaneous	14	27
Total	200	173

2. Methodology

The California Legislature's Office of the Auditor General collected fiscal data from 11 California school districts. (SRI staff participated in the data collection in the majority of these LEAs.) After publication of the Auditor General's report in September 1977, we decided to reanalyze the cost data for 6 districts:

- Berryessa Unified School District, Santa Clara County
- Cabrillo Unified School District, San Mateo County
- Chino Unified School District, San Bernardino County
- Encinitas Unified School District, San Diego County
- Escondido Unified School District, San Diego County
- San Diego Unified School District, San Diego County.

Several factors contributed to this decision:

(1) The SRI model requires that the program of instruction be held constant when YRS and TCS costs are compared. In some cases, the Auditor General's analysis assumed program changes; e.g., the staffing ratio was changed or the schedule for nursing or counseling services was revised. Our reanalysis holds the program constant.

(2) Construction costs avoided because of the implementation of the YRS program were not computed consistently across LEAs.* There are instances where the simulation of reversion to a traditional schedule was assumed not to include construction costs because of the availability of

*It should be noted that only two of the six LEAs implemented YRS programs primarily for cost-related reasons.

portable classrooms or surplus capacity in other schools.* Our reanalysis treats simulated school construction consistently.

(3) Careful scrutiny of the LEA data revealed inconsistent handling of components of operating cost, such as utilities and transportation. (For example, transportation expenditures were not considered in the original Chino analysis.) Our reanalysis treats these components consistently. (In some cases, such as Chino, this required that we collect additional data.)

In the following section we review each of the six LEAs. The cost figures result from our reanalysis. Table F-3 shows the original Auditor General figures for the six LEAs.

Table F-3

AUDITOR GENERAL CALCULATION OF YRS SAVINGS (COSTS) DUE TO YRS PROGRAMS

Berryessa	$(147,200)
Cabrillo	(38,300)
Chino	(266,700)
Encinitas	(31,300)
Escondido	243,600
San Diego	(87,900)
Total	$(327,800)
Average	(54,633)

3. California District Data

a. Berryessa Unified School District, Santa Clara County

The 1975-76 composition of the district, with a total enrollment of about 9,770 in 15 schools, was:

*Terms like "available" and "surplus" obviously are relative; e.g., is a portable classroom available if it is being used for curriculum planning?

	TCS	YRS
Elementary schools	8	4
Junior high schools	1	2

The 1975-76 school year* was unusual because Berryessa completed building two new elementary schools in midyear. From September to March the students to be enrolled at these two schools were housed in other elementary schools (two year-round and one traditional-calendar school). The district was tremendously overcrowded during that early period; but after the new schools opened in March, there was not only space for the current enrollment but ample room for growth.

To compensate for the midyear school openings, SRI subtracted out the associated costs. All nonteacher costs associated with these two schools both before and after the March move were removed† from the actual costs for mandatory services. We simulated the costs of having 14 additional classrooms constructed and of the administrative staff necessary to support the new space ("Estimated Costs for Mandatory Services Under Expanded TCS" in Table F-4).

Berryessa plans to continue a year-round program, but has reduced the program to a single track. Most of the community is in favor of YRS, but the district no longer needs the additional space a 4-track program would provide.

b. Cabrillo Unified School District, San Mateo County

In 1972-73, Cabrillo faced a housing problem. All elementary and junior high schools were operating at capacity, with one elementary requiring two double-session classes. In response to this situation, the taxpayers authorized some general obligation bonds for long-range facility development. However, to house the surplus enrollment, the district established a pilot year-round program in one elementary school. In 1974-75, the remaining three elementary schools and the one junior high initiated YRS programs. Only two elementary schools and the junior high had

*Unless otherwise indicated, all LEA data are for the 1975-76 school year.

†The district had administratively staffed up between July and February in anticipation of opening these two schools.

Table F-4

BERRYESSA COST ANALYSIS

Accounting Category	Actual Costs for Mandatory Services	Estimated Costs for Mandatory Services Under Expanded TCS Program
1000 Certificated Salaries	$ 6,714,202	$ 6,675,244
2000 Classified Salaries	2,125,561	2,089,353
3000 Employee Benefits	1,123,764	1,127,609
4000 Books, Supplies, and Equipment Replacement	849,022	843,886
5000 Contracted Services	792,682	790,178
6000 Sites, Building	259,140	404,337
7000 Other Outgo	190,700	190,700
Total	$12,055,071	$12,121,307

4-track programs.* The 1975-76 composition of the district, with a total enrollment of about 3,000 in six schools, was as follows:

	TCS	YRS
Elementary schools	0	4
Junior high schools	0	1
Senior high schools	1	0

By 1975-76, the district had finished its multi-million-dollar building program and was continuing the rotating tracks of a year-round calendar for purposes other than cost savings. At this point, the district considered the YRS program a mechanism for facilitating "spaced learning cycles" and providing an opportunity for additional days of instruction (via intersession) for educationally disadvantaged students. The district business manager stated that the community had made a gradual transition into backing the YRS program. There is strong support in the community for continuation of a year-round calendar. The cost analysis results are shown in Table F-5.

c. Chino Unified School District, San Bernardino County

Chino turned to a YRS program anticipating rapid growth of its student population; the district wanted to eliminate double sessions without incurring large construction costs.

The 1975-76 school year was the first year of the YRS program in Chino. With a total enrollment of about 10,625 in 13 schools, the district had the following composition during that year:

	TCS	YRS
Elementary schools	0	8
Junior high schools	0	2
Senior high schools	3	0

All but two schools offered a TCS track. Participation in the YRS program was completely voluntary during the first year of operation. (The district anticipated that by the end of 1977-78 they would have increased their savings substantially, because not only would more students

*The junior high and one elementary school also had a TCS track.

Table F-5

CABRILLO COST ANALYSIS

Accounting Category	Actual Costs for Mandatory Services	Estimated Costs for Mandatory Services Under Expanded TCS Program
1000 Certificated Salaries	$2,560,232	$2,559,780
2000 Classified Salaries	890,341	890,083
3000 Employee Benefits	520,489	522,070
4000 Books, Supplies, and Equipment Replacement	355,243	356,180
5000 Contracted Services	313,522	310,492
6000 Sites, Building	168,568	178,856
7000 Other Outgo	254,993	254,993
Total	$5,063,388	$5,072,454

be participating but the distribution of students across tracks would be more efficient.) The cost analysis results are shown in Table F-6.

The district's mix of students in 1975-76 was 80% YRS and 20% TCS. This proportion was expected to remain stable over the next few years. The current YRS policy includes only students through the 8th grade. The district expects that the parents will request that at least one of the regular high schools be converted to a YRS calendar. (The district has attempted to keep all children in a family on one track but cannot do this when a child goes into senior high.)

d. Encinitas Unified School District, San Diego County

As a growing suburban community, Encinitas has been faced with a space shortage for some time. By 1974, Encinitas policymakers were faced with a choice: either go on double sessions or try a YRS program. Although they were able to get another bond issue passed, the district felt that, with declining enrollment probably inevitable sometime in the future, they should incorporate a year-round program into their long-range plan. Economically the district would save money (and taxes) by having to build fewer schools. In 1974-75, Encinitas started its first YRS program.

In 1975-76, the district had approximately 2,150 students in five elementary schools. Of the four schools with YRS programs, three had only two tracks and the fourth school had a single track. The results of the cost analysis are shown in Table F-7.

Even though Encinitas was able to build a new school, the district expanded its YRS program. For the 1978-79 school year, it will have a total of five 4-track programs, one single-track program, and one school for students who want to be on a traditional calendar. The majority of the community supports the maintenance of a YRS program.

e. Escondido Unified School District, San Diego County

In 1971-72, Escondido had approximately 3,000 K-3 students on double sessions, and in the next year the space problem would have forced the district to institute double sessions in all grades, K-8. The district had two bond election failures, one in 1969 and another in 1971. A citizen's committee studied the feasibility of a YRS program during the 1971-72 school year, and a pilot program was initiated in three schools during the 1972-73 school year. Three more schools were incorporated into the YRS system during 1973-74, and in November 1974 the district electorate voted to make all 13 schools YRS. The conversion was completed in 1975.

Escondido is the only district studied that had an exclusively YRS program. All 13 schools in the district (10 elementary schools and 3 junior highs) had a 4-track rotating system. All 9,520 students are on a YRS program. Table F-8 shows the cost analysis results.

Table F-6

CHINO COST ANALYSIS

Accounting Category	Actual Costs for Mandatory Services	Estimated Costs for Mandatory Services Under Expanded TCS Program
1000 Certificated Salaries	$ 8,523,643	$ 8,508,042
2000 Classified Salaries	2,623,773	2,584,042
3000 Employee Benefits	1,321,824	1,365,334
4000 Books, Supplies, and Equipment Replacement	750,191	750,104
5000 Contracted Services	716,763	703,529
6000 Sites, Building	329,508	393,181
7000 Other Outgo	498,009	498,009
Total	$14,763,711	$14,802,314

Table F-7

ENCINITAS COST ANALYSIS

Accounting Category	Actual Costs for Mandatory Services	Estimated Costs for Mandatory Services Under Expanded TCS Program
1000 Certificated Salaries	$1,502,603	$1,497,049
2000 Classified Salaries	484,165	449,880
3000 Employee Benefits	257,287	252,145
4000 Books, Supplies, and Equipment Replacement	174,874	172,616
5000 Contracted Services	144,075	142,142
6000 Sites, Building	36,588	36,588
7000 Other Outgo	890,964	890,964
Total	$3,490,556	$3,441,384

Table F-8

ESCONDIDO COST ANALYSIS

Accounting Category	Actual Costs for Mandatory Services	Estimated Costs for Mandatory Services Under Expanded TCS Program
1000 Certificated Salaries	$ 6,769,524	$ 6,715,319
2000 Classified Salaries	2,211,453	2,213,724
3000 Employee Benefits	1,064,591	1,071,029
4000 Books, Supplies, and Equipment Replacement	502,144	507,231
5000 Contracted Services	569,276	607,723
6000 Sites, Building	173,886	427,285
7000 Other Outgo	678,156	678,156
Total	$11,969,030	$12,220,467

Currently, it is infeasible for the district to consider returning to a TCS program because of increasing student population and lack of funds for constructing new schools. Even with YRS programs, the district will find it hard to house all its students by the 1980-81 school year. However, there are mixed feelings about the YRS program in Escondido. Some teachers are working on community committees supporting return to a TCS system.

f. San Diego Unified School District, San Diego County

San Diego has had unusual space problems. Out of the 59 schools in the district, only a few of the schools had severe space shortages; the ramaining schools had adequate space. However, the failure of bond issues meant that the schools with shortages were faced with a choice of double sessions or a YRS program.

San Diego started its YRS program in six schools in the 1972-73 school year. There have been a number of different schools with YRS programs in San Diego; some of the original schools have been dropped while others have been added. With a total enrollment of 119,245 in its 59 schools, the 1975-76 composition of the district was as follows:

	TCS	YRS
Elementary schools	18	7
Junior high schools	19	0
Senior high schools	15	0

Only three of the seven YRS schools had 4-track programs; the remaining four had single-track programs.

San Diego had a "surplus" of portable trailers. The district stated that the need for an additional 25 classrooms could be filled by the "extra" portables on hand. After a phone conversation with the district business manager, SRI staff determined that most of these portables were being used for educational services (libraries, media centers, etc.) in other schools around the district. Using SRI assumptions, removing these portables would have changed the educational quality of the school. For this reason, we decided to simulate the construction of the needed classrooms at each school. Also, since the district seemed to be in the habit of using portables, we did another simulation where portables were purchased in place of building classrooms. Table F-9 shows the results of the cost analysis.

San Diego's future plans include a total of eight schools on a YRS calendar during the 1978-79 year. Four of these schools will use a 4-track system. There is substantial support among parent and staff for

Table F-9

SAN DIEGO COST ANALYSIS

Accounting Category	Actual Costs for Mandatory Services	Estimated Costs for Mandatory Services Under Expanded TCS Program
1000 Certificated Salaries	$102,059,311	$102,051,897
2000 Classified Salaries	29,098,876	29,053,573
3000 Employee Benefits	16,085,528	16,081,862
4000 Books, Supplies, and Equipment Replacement	7,289,723	7,289,723
5000 Contracted Services	7,193,081	7,192,060
6000 Sites, Building	9,790,547	9,950,297 (9,881,944)*
7000 Other Outgo	4,685,815	4,685,815
Total	$176,202,881	$176,305,227 (176,236,874)*

*These figures represent the purchase and installation of portables rather than construction of new classrooms.

the continuation of the YRS program. The district considers it both economically and educationally advantageous and has no plans to discontinue the program in the near future.

4. Summary

This appendix reports on the cost analyses of year-round school programs in six California LEAs. In 1975-76 these districts saved an average of $70,000 annually by operating on the year-round schedule. Individual district savings ranged from $9,000 to $251,000. The one district that was not saving money--Encinitas, where the annual added cost was $49,000--is using YRS programs in four schools for reasons other than cost savings. Although the 45-15 YRS program permits an enrollment increase of up to one-third using existing school facilities, one Encinitas school has not changed its enrollment at all and two others have made only minimal increases. Thus, Encinitas has not taken advantage of the capital cost savings inherent in a YRS program.

Such a diversity of LEA results serves to underscore the conclusion reached at PVUSD: the introduction of a year-round schedule serves as a catalyst for many changes not related to the YRS program. Thus, the expected cost savings often do not materialize because of the incremental expense associated with these other changes. There are two lessons to be learned from this experience:

- LEA policymakers should be forewarned that anticipated cost savings will shrink dramatically unless the schedule change is managed judiciously.
- Any comparison between the existing and alternative schedules must hold the educational program constant.

Overall the results of the analysis reinforce our conclusion that a careful implementation of a YRS program will result in substantial cost savings.

GLOSSARY FOR COST ANALYSIS*

ACCOUNTING. The procedure of maintaining systematic records of events relating to persons, objects, or money and summarizing, analyzing, and interpreting the results of such records.

ACCOUNTING COST. The amount of money (or money's worth) exchanged for property or service(s).

ACCOUNTING SYSTEM. The total mechanism of records and procedures of recording, retrieving, and reporting information on the financial position and operations of a governmental unit or any classifying of its funds, balanced account groups, and organizational components.

ACTUAL COST. The financial outlays, evaluated at site-specific prices, associated with the acquisition of a particular resource. (In contrast to Standard Cost.)

ADMINISTRATION. The act of managing or directing some or all of the activities of an LEA.

ADMINISTRATIVE PERSONNEL. Staff members on the LEA payroll who are primarily engaged in activities which have as their purpose the general regulation, direction, and control of the affairs of the LEA.

ADMINISTRATOR. A staff member who has been given the responsibility to manage or direct some or all of the activities of an LEA.

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*These definitions come from four sources:

- Financial Accounting Handbook II (NCES, 1973)
- "Cost Analysis for Educational Program Evaluation" (Haller, 1974)
- "Cost-Effectiveness Analysis in Evaluation Research" (Levin, 1975)
- Year-Round Education Handbook (California, 1975)

AMORTIZE. To write off expenditures by prorating the total over a fixed period (e.g., $1,000 amortized over 20 years involves writting off $50 per year).

AVERAGE COST. The total cost of a program divided by the enrollment served. (See Unit Cost.)

AVERAGE DAILY ATTENDANCE (ADA). The aggregate days of attendance (including excused absence) of a given school during a reporting period, divided by the number of days school is in session during this period. Only days on which the pupils are under the guidance and direction of teachers should be considered as days in session. The average daily attendance for groups of schools having varying lengths of terms is the sum of the average daily attendances obtained for the individual schools. (See also Day in Session and Day of Attendance.)

BACKGROUND VARIABLES. Variables, such as enrollment, that are beyond the control of policymakers (also called planning factors or exogenous variables).

BASIC INSTRUCTION (BASIC INSTRUCTIONAL PROGRAM). The core educational program required by law (i.e., so many minutes of instruction per day for so many days per year).

BENEFITS. See Employee Benefits.

BREAK POINT. The enrollment point at which the per-pupil cost of the TCS program first exceeds the per-pupil cost of the YRS program.

BUDGETARY COSTS. Costs determined from budget accounts. For example, the budgetary cost of certificated personnel is the total expenditure associated with that account.

CAPITAL COST. A one-time expenditure associated with the acquisition of a long-lived resource (a resource having a life longer than 1 year). These resources are also called fixed assets. The expenditure itself is nonrecurring, although it may be written off periodically (amortized). Examples are buildings and buses.

CATEGORICAL PROGRAM. A form of special educational service for which not all students are eligible. Examples are programs for the disadvantaged (Title I), handicapped (EHA), and bilingual (Title VII).

CERTIFICATED STAFF. LEA personnel possessing the legal document giving authorization from the State (or an agency or organization authorized by the State) to perform certain services for the LEA. ("Licenses" which meet these criteria should be regarded as "certificates.") Included are teachers, principals, and professional support personnel such as psychologists.

CERTIFICATION. The general process by which the State (or an agency or organization authorized by the State) provides a credential to an individual.

CHART OF ACCOUNTS. A list of all accounts generally used in an individual accounting system. In addition to account titles, the chart includes the account numbers that have been assigned to each account. Accounts in the chart are arranged with accounts of a similar nature, for example, assets and liabilities.

CLASS SIZE. See Staffing Ratio.

CLERICAL PERSONNEL. Staff members performing activities concerned with preparing, transferring, transcribing, systematizing, or filing written communications and records. Included are stenographers and secretaries.

COMPARABILITY. The characteristic of commonality among or between selected elements measured in terms of identical constants. The accuracy of the measurement of the degree of comparability is usually dependent on the number of constants applied.

COMPENSATION. The total expenditure for an employee: salary plus benefits.

COST ACCOUNTING. That method of accounting which provides for the assembling and recording of all the elements of cost incurred to accomplish a purpose, to carry on an activity or operation, or to complete a unit of work or a specific job.

COST ANALYSIS. The process of analysis which focuses on enumeration of the resources allocated to specific programs. (Resources are usually computed as budgetary costs.)

COST-BENEFIT ANALYSIS. The process of analysis which provides the means for comparing the resources to be allocated to a specific program with the results likely to be obtained from it; or, analysis which provides the means for comparing the results likely to be obtained from the allocation of certain resources with the achievement of alternative or competing objectives (where the results are computed in monetary terms).

COST-EFFECTIVENESS ANALYSIS. The process of analysis designed to measure the extent to which resources allocated to a specific object under each of several alternatives actually contribute to accomplishing that objective, so that different ways of gaining the objective may be compared.

COST MODEL. A procedure used to develop a representation of reality that is useful to policymakers looking primarily at economic decisions.

CREDENTIAL. The document issued to a staff member by the State (or an agency or organization authorized by the State) authorizing the holder

to perform services for the LEA. "Certificate," "license," and "permit" are examples of terms frequently used interchangeably with "credential."

CURRENT EXPENDITURES PER PUPIL. Current expenditures for a particular period of time divided by a pupil unit of measure.

CURRICULUM. The planned interaction of pupils with instructional content, instructional resources, and instructional processes for the attainment of educational objectives.

DAY IN SESSION. A day on which the school is open and the pupils are under the guidance and direction of teachers in the teaching process. On some days the school plant itself may be closed and the student body as a whole engaged in school activities outside the school plant under the guidance and direction of teachers. Such days should be considered as days in session. Days on which school is closed for such reasons as holidays, teachers' institutes, and inclement weather should not be considered as days in session.

DAY OF ATTENDANCE. A day of attendance is one in which a pupil is present for the full day under the guidance and direction of a teacher while school is in session. When a pupil is present for only part of the day, it should be considered as a partial day of attendance in the same proportion that his/her time present at school bears to the total length of the school day. If overcrowded conditions make it necessary to hold two separate sessions with a different group of pupils in each session, a pupil attending for all of either session should be considered as having attended for the full day. An excused absence because of sickness, or for any other reason, is counted as a day of attendance. (See also Day in Session.)

DEEP CLEANING. Intensive classroom cleaning (such as cleaning of light fixtures and desks) normally performed during the summer under a traditional-calendar schedule.

DERIVED VARIABLES. Variables determined by the interaction of background and policy variables.

DIRECT COSTS. Those elements of cost which can be easily, obviously, and conveniently identified with specific activities or programs, as distinguished from those costs incurred for several different activities or programs and whose elements are not readily identifiable with specific activities. (See also Indirect Costs.)

DIRECT SERVICES. Activities identifiable with, and directed specifically to, an individual program. Those activities concerned with the teaching-learning process are considered to be direct services for instruction.

ECONOMIC MODEL. See Cost Model.

ELEMENTARY SCHOOL. A school classified as elementary by State and local practice and composed of any span of grades not above grade 8. A nursery school or kindergarten school is included under this heading only if it is an integral part of a regularly established school system.

EMPLOYEE BENEFITS. Compensation, in addition to regular salary, provided to an employee. This may include such benefits as health insurance, life insurance, annual leave, sick leave, retirement, and social security.

ENRICHMENT PROGRAM. Supplementary instructional experiences provided pupils according to their special needs, abilities, and interest. For preschool or preprimary culturally deprived children, this refers to experiences designed to aid in their transition from home to a school environment, with the emphasis on language development in preparation for reading instruction; frequently, such programs are supplemented by counseling with parents and by home visits from school staff members. For other pupils, such as the gifted, talented, or college bound, this term refers to special instructional experiences provided in addition to instruction generally provided most pupils.

EQUILIBRIUM POINT. See Break Point.

EQUIPMENT. Any instrument, machine, apparatus, or set of articles that (a) retains its original shape and appearance with use and (b) is non-expendable; i.e., if the article is damaged or some of its parts are lost or worn out, it is usually more feasible to repair it than to replace it with an entirely new unit.

EXCEPTIONAL CHILDREN. Children who, because of certain atypical characteristics, have been identified by professionally qualified personnel as requiring special educational planning and services, whether or not such services are available. In general, the term "exceptional children" considers exceptionality on the basis of (a) physical handicap, (b) emotional and/or social handicap, and (c) measurable exceptionality in mental ability, i.e., mentally gifted and mentally retarded. Some exceptional children have more than one type of exceptionality (see Special Education).

EXOGENOUS VARIABLE. See Background Variable.

EXTENDED CONTRACT. A contract for a year-round school employee that is longer than the length customary for the same position under a traditional calendar.

FACILITY. A piece of land, a building site, a building, or part of a building.

FISCAL PERIOD. Any period at the end of which an agency determines its financial condition and the results of its operations and closes its books. It is usually a year, though not necessarily a calendar year. The most common fiscal period is from July 1 through June 30.

FISCAL SERVICES. Activities involved with managing and conducting the fiscal operations of the LEA. This service area includes budgeting,

receiving and disbursing, financial accounting, payroll, internal auditing, and purchasing.

FIXED COST. A cost that does not change (within broad limits) as the educational program expands or contracts.

FIXED ASSETS. Land, buildings, machinery, furniture, and other equipment which the LEA intends to hold or continue in use over a long period of time. "Fixed" denotes probability or intent to continue use of possession, and does not indicate immobility of an asset.

45-15 YRS. A year-round schedule in which a given student attends school for 9 weeks (45 days) and then is on vacation for 3 weeks (15 days). This 45-15 pattern repeats four times over the period of a year. Ordinarily, the 45-15 plan includes four groups or tracks of students, whose schedules are staggered such that at any given time three tracks are in session and the fourth is on vacation.

FULL-TIME EQUIVALENCE. The amount of time for a more- or less-than-full-time activity divided by the amount of time normally required in a corresponding full-time activity. Full-time equivalence (FTE) usually is expressed as a decimal fraction to the nearest tenth. A teacher with an extended contract is, for example, 1.2 FTE. This affects staffing ratio.

FUND. An independent accounting entity with its own assets, liabilities, and fund balances. Generally, funds are established to account for financing of specific activities of an agency's operations.

GENERAL FUND. The accounting entity for all transactions that do not have to be accounted for in another fund. It is used to account for all ordinary operations of an LEA.

GENERAL LEDGER. A book, file, or other device in which accounts are kept to the degree of detail necessary, summarizing the financial transactions of the LEA. General ledger accounts may be kept for any group of receipt or expenditure items on which an administrative officer wishes to maintain a close check.

IMPLEMENTATION COST. See Transition Cost.

INCREMENTAL COST. The difference between costs that will be incurred if a program is changed and those that would have been incurred had the program not been changed. (See Sunk Cost.)

INDIRECT COSTS. Those elements of cost which are of such nature that they cannot be readily or accurately identified with a specific service. For example, the custodial staff may clean corridors in a school building which is used jointly by administrative, instructional, maintenance, and attendance personnel. In this case, a part of custodial salaries is an indirect expense of each service using the corridors. However, it is impossible to determine readily or accurately the amount of the salary to charge each of these services. (See also Direct Costs.)

INSTRUCTIONAL PERSONNEL. Those who render direct and personal teaching services. Included are teachers (including teachers of the homebound), teaching assistants, teacher aides, secretaries for teachers, special graders, substitute teachers, and clerks serving teachers only. Attendance personnel should not be included as instructional personnel.

INTERSESSION. Voluntary instructional programs available to children on a particular YRS track while that track is on vacation.

JUNIOR HIGH SCHOOL. A separately organized and administered secondary school intermediate between the elementary and senior high schools.

KINDERGARTEN. A group or class that is organized to provide educational experiences for children for the year immediately preceding the first grade. A kindergarten class may be organized as a grade of an elementary school or as part of a separate kindergarten school. In some LEAs these groups may be called preprimary, junior primary, or primary.

LIABILITIES. Debts or other legal obligations arising out of transactions in the past which are payable but not necessarily due. Encumbrances are not liabilities; they become liabilities when the services or materials for which the encumbrances were established have been rendered or received.

LOCAL EDUCATION AGENCY (LEA). An educational agency at the local level which exists primarily to operate schools or to contract for educational services. Normally, taxes may be levied by such publicly operated agencies for school purposes. These agencies may or may not be coterminous with county, city, or town boundaries. This term is used synonymously with the terms "school district" and "school system."

MAINTENANCE PERSONNEL. Personnel on the school roll who are engaged primarily in the repair and upkeep of grounds, buildings, and equipment.

MARGINAL COST. The additional (or incremental) cost of producing one additional unit of some good or service (e.g., serving one additional student).

MIGRANT EDUCATION. A program of instruction and services for those children who move periodically with their families from one school district to another in order that a parent or member of the immediate family may secure seasonal employment.

NONLINEAR INCREMENTAL COST. An incremental cost that does not vary directly with enrollment (e.g., one that varies as a step function).

NONRECURRING COST. A financial outlay met only once.

NONSTANDARD CONTRACT. A year-round school personnel contract that is either longer or shorter than the usual (standard) contract. (See Standard Contract.)

OPERATING COST. Recurring costs required to operate a program over time. Examples are salaries and benefits, utilities, and transportation supplies.

OVERCROWDED. School conditions in which the class size is considerably greater than that considered optimal.

OPERATIONAL UNIT. A separately budgeted subdivision of an LEA established to carry out a major objective or group of objectives, such as a school, a transportation unit, or an athletic department.

OPPORTUNITY COST. Benefits foregone; the value of a resource considered in its optimal use.

OVERHEAD COSTS. Those elements of cost necessary in the production of an article or the performance of a service which are of such a nature that the amount applicable to the product or service cannot be determined accurately or readily. Usually, they relate to those objects of expenditure which do not become an integral part of the finished product or service, such as rent, heat, light, supplies, management, supervision, and other similar items. (See also Indirect Costs.)

PERSONNEL. Employees of an LEA or any persons under the supervision of the LEA who are eligible for worker's compensation, the Federal Insurance Contribution Act, or wage or salary tax withholding. Included are persons who volunteer their services.

POLICY VARIABLE. A decision variable that is under the control of policymakers (for example, staffing ratio).

PRESENT VALUE. The value in the current period of monetary outlay to be incurred in future periods.

PUPIL. An individual for whom instruction is provided in an educational program under jurisdiction of a school, school system, or other educational institution. No distinction is made between the terms "student" and "pupil"; both terms include individuals at all instructional levels.

RECURRING COST. A monetary outlay repeatedly incurred as the result of program operation.

REGULAR CLASS. The general type of class in which most pupils receive instruction, including most classes other than those composed of exceptional pupils.

RETIREMENT FUND SYSTEM. A plan whereby a fund of money, built up through contributions from participants and other sources, is used to make regular payments to those who retire from service in the educational system by reason of age, disability, or length of service.

REVENUES. Additions to assets which do not increase any liability, do not represent the recovery of an expenditure, do not represent the cancellation of certain liabilities without a corresponding increase in other liabilities or a decrease in assets, and do not represent contributions of fund capital in food service and pupil activity funds.

SALARY. The total amount regularly paid or stipulated to be paid to an individual, before deductions, for personal services rendered while on the payroll of the LEA.

SCHOOL BUS. A vehicle used for transporting students, with a manufacturer's rated seating capacity of 12 or more and with at least 13 inches of seat space per pupil.

SCHOOL DAY. That part of a calendar day when school is in session.

SCHOOL PLANT. The site, buildings, and equipment constituting the physical facilities used by a single school or by two or more schools sharing the use of common facilities.

SCHOOL TERM. A prescribed span of time when school is open and the pupils are under the guidance and direction of teachers. Under the traditional calendar the school term usually extends from September to June. Under the year-round calendar, the term is synonymous with the full school year (see below).

SCHOOL YEAR. The 12-month period denoting the beginning and ending dates for school accounting purposes, usually from July 1 through June 30.

SIMULATION. A projected (i.e., imaginary) replication of a program, with a given set of policy or background variables.

SIMULATED COSTS. Monetary outlay associated with a simulated program.

SOURCE OF FUNDS. The agency, governmental or otherwise, which appropriates money used by a local school or LEA.

SPECIAL EDUCATION. Direct instructional activities designed primarily to deal with students who are (1) physically handicapped, (2) emotionally disturbed, (3) culturally different (or in need of compensatory education), (4) mentally retarded, or (5) mentally gifted and talented. It may involve preprimary, elementary, secondary, postsecondary, or adult/continuing education. (In this study the term is restricted to activities conducted in classrooms other than those used for basic instruction.)

STAFF ACCOUNTING. Services rendered in connection with the systematic recording, filing, and storing of information related to staff members employed by the LEA.

STAFF MEMBER. A person whose relationship with the LEA meets the following criteria:

- Performs activities or provides services for the LEA, under the direction or control of the agency's governing authority, for compensation or on a volunteer basis.
- Is considered an employee for the purpose of worker's compensation, the Federal Insurance Contribution Act, and wage or salary tax withholding.

STAFFING RATIO. Usually the ratio of students to teacher(s) in a class. Also called "class size."

STANDARD COST. Financial outlay associated with a particular resource evaluated at regional or national prices.

STANDARD CONTRACT. The usual contract for personnel of a given classification. In PVUSD, for example, the standard teaching contract is for 176 days. (See Nonstandard Contract.)

START-UP COST. See Transition Cost.

STEP FUNCTION. A relationship between two variables that does not vary consistently as the magnitude of the independent variable increases.

STRUCTURAL COST MODEL. A symbolic depiction of an economic decision situation relating policy, background, and derived variables.

STUDENT-TEACHER RATIO. See Staffing Ratio.

SUMMER SCHOOL. The name usually applied to the school session carried on during the period between the end of the regular school term and the beginning of the next regular school term under a traditional calendar.

SUNK COST. Costs that have already been incurred as the result of past decisions. (See Incremental Cost.)

SUPPLY. A material item of an expendable nature that is consumed, worn out, or deteriorated in use, or that loses its identity through fabrication or incorporation into a different or more complex unit or substance.

SURPLUS CLASSROOMS. Classrooms that were in use under a traditional calendar and (theoretically) become available for alternative use under the year-round schedule.

TCS (Traditional-Calendar School). A school that is operating under the common 9-month (usually September to June) schedule (as opposed to the year-round schedule).

TEACHER. A person who instructs students.

TEACHER AIDE. A person who assists a teacher with routine activities associated with teaching and with those activities requiring minor decisions regarding students, such as monitoring, conducting rote exercises, operating equipment, and clerking.

TEXTBOOKS. Books obtained primarily for use by certain classes, grades, or other particular student groups rather than for general school use.

TOTAL COST. The sum of fixed and variable costs associated with a program.

TRACK. A group or cohort of students with the same school and vacation schedule under a year-round program. A 45-15 YRS plan, for example, usually includes four tracks of students; YRS teachers may be assigned to one or more tracks.

TRACK CHANGE. The time when one cohort leaves school and another enters.

TRANSITION COST. Resources required to develop a program to the stage where it can be introduced.

UNIT COST. The total expenditure in a given period divided by the number of students enrolled in a particular period; per-pupil cost.

VARIABLE COST. Dollar outlay that is closely related to the size of the program and varies with program size (as opposed to fixed cost).

YRS (Year-Round School). A school that is operating under one of several alternative schedules in which some portion of the school's enrollment is in attendance at any time during the calendar year. (See, for example, 45-15 YRS.)

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